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USSR Report

MILITARY AFFAIRS

AVIATION AND COSMONAUTICS

No 3, March 1985

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Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal AVIATSIYA I KOSMONAVTIKA published in Moscow.

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KUZOVOV PRAISES VIRTUES OF SOCIALIST COMPETITION

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 1-3

[Article by Lt Gen Avn Vladimir Il'ich Kuzovov, first deputy chief of the Air Forces Political Directorate: "High Degree of Effectiveness to Socialist Competition"]

[Text] Air Forces personnel are working aggressively in the new training year, the final year of the 11th Five-Year Plan, the year of the 40th anniversary of the Victory by the Soviet people in the Great Patriotic War and year of preparations for the 27th CPSU Congress. These important milestones in our country's history are exerting considerable influence on sociopolitical and job-related active efforts by Air Forces personnel. In an atmosphere of constantly increasing international tension and a genuine military threat on the part of imperialism, military aviation personnel are redoubling their efforts in military labor and are going all out to strengthen national defense and increase the combat readiness of the Air Forces.

Soviet aviation personnel unanimously approve of and support the domestic and foreign policy of the CPSU and Soviet Government. They perceived as a guide to action decisions of the April and October (1984) CPSU Central Committee plenums as well as the instructions and conclusions contained in the speech by CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, at a CPSU Central Committee Politburo session, at which tasks pertaining to bringing the 11th Five-Year Plan to an end in a worthy manner were examined and ways to accomplish the economic and social tasks for the current year were determined, as well as in his article entitled "To the Level of the Demands of Developed Socialism" (KOMMUNIST, No 18, 1984), which addresses several pertinent problems of CPSU theory, strategy and tactics at the present major point of historic change.

At the present stage of our country's economic and social development the party is focusing us on strengthening the role of socialist competition in intensification of the economy, more efficient utilization of production potential, more rapid adoption of scientific and technological advances, development of the labor and social activeness of working people, and on securing on this foundation a further strengthening of the economic and defense might of the homeland.

Our party proceeds from V. I. Lenin's statement that organization of competition should occupy a prominent place among the tasks of Soviet rule. An important role among measures aimed at development of innovativeness and initiative by the masses is played by the CPSU Central Committee decree entitled "On Improving the Organization and Practice of Totaling Up Socialist Competition Results and Rewarding Competition Winners." The demands of this most important party document apply in full measure to the activities of Air Forces commanders, political agencies, headquarters staffs, party and Komsomol organizations. Concern for increasing the effectiveness of socialist competition is continuously displayed in the overwhelming majority of units and subunits. Efforts are made to ensure that military collectives approach in a well-substantiated manner the drafting and adoption of socialist pledges and to ensure that their content to an ever increasing degree fosters improvement in combat readiness, air, weapon and tactical proficiency, rapid and high-quality mastery of new aircraft equipment, and the forming of excellent moral-fighting qualities in personnel. Leader-communists have begun showing greater concern with increasing the effectiveness and innovative nature of competition and with strengthening its role in intensification of the training process and development of job-related and civic activeness on the part of aviation personnel.

A number of Air Forces military collectives have brought forth innovative initiatives and undertakings which reflect the requirements of the above-mentioned CPSU Central Committee decree. Such initiatives, for example, as "A Higher Level of Mastery of New Equipment," "For an Excellent Performance Result for Each Day of Training," and others have become quite widespread. In the outfit in which commanders and political workers officers Yu. Temnikov, G. Sokhanich, A. Anpilogov, V. Dobrynin, S. Galstyan and others serve, purposeful work aimed at achieving the fullest possible exploitation of the combat capabilities of aircraft systems and at meeting the demands formulated in the slogan "Each and Every Bomb, Missile and Rocket Into the Target on the First Pass!" is being performed with the active participation of pilots, engineers, and technicians. Competition pertaining to tasks and performance standards at tactical air and specialized tactical exercises, on regular scheduled training sorties, and in routine scheduled maintenance activities has been greatly stepped up. An important place is also assigned to competition for mastering related occupational specialties and for preparedness to perform job duties at one level above one's present assignment slot.

In many Air Forces units and subunits commanders and political workers, party and Komsomol activists work innovatively to develop and improve socialist competition for the title of best pilot, navigator, and aviation engineer service specialist. This helps boost lagging performers, fosters the dissemination and adoption of advanced know-how, and has a positive effect on results of the training and indoctrination process.

In the course of preparations for celebrating the 40th anniversary of the Victory of the Soviet people in the Great Patriotic War, competition for the honor of flying a training sortie in place of a hero from the same unit and the honor of support-servicing that training sortie has proven out well. It is having an especially positive effect on the period of breaking-in and

familiarization of young pilots and technicians, developing in them an aspiration toward vigorous activity, toward improving their job expertise, and instilling a feeling of responsibility for accomplishing adopted socialist pledges.

Party committees and buros have begun taking more purposeful part in drafting and adoption of socialist pledges by aviation personnel, in organizing competition, in totaling up competition performance results, and in determining winners. Party organizations of vanguard units and subunits have formed the practice of monthly analysis of accomplishment of group and individual pledges by party members as well as ensuring personal exemplariness in competition, which is in conformity with the requirements of the CPSU Central Committee decree entitled "On Improving the Organization and Practice of Totaling Up Socialist Competition Results and Rewarding Competition Winners."

Komsomol organizations also take active part in this. They come forth with useful initiatives aimed at increasing the activeness of Komsomol members in accomplishing combat and political training tasks and in strengthening military discipline and organization.

It is clearly apparent at the present time, when the winter period of training is in full swing, that more considerable success is achieved wherever competition is organized in conformity with Leninist principles and the demands of the present day, where it is directed in a practical manner. This is precisely how things stand in the guards Red-Banner bomber regiment under the command of Gds Col A. Tsar'kov. The men of this unit were initiators of socialist competition in the Air Forces under the slogan "Our Selfless Military Labor in Honor of the 40th Anniversary of the Great Victory and the 27th CPSU Congress!" and intend to carry out with excellent quality the decisions of the 26th CPSU Congress and subsequent CPSU Central Committee plenums, as well as the demands of the USSR minister of defense pertaining to further strengthening the combat might of the Soviet Armed Forces and preparing them for the conduct of aggressive combat operations to repulse aggression from whatever quarter. Competition in this unit, in conformity with the demands of the CPSU Central Committee decree entitled "On the 40th Anniversary of Victory by the Soviet People in the Great Patriotic War of 1941-1945," competition is organically linked with the training and indoctrination process and fosters successful accomplishment of combat and political training tasks, strengthening of military discipline, and ensuring flight operations safety. Progress in meeting pledges is being rigorously monitored in all flights in this unit, publicity to competition is being secured in a practical manner, advanced know-how is being publicized and adopted, and comradely mutual assistance is being developed.

Many pilots, navigators, engineers and technicians in this guards unit are genuine experts at their job, experienced commander-indoctrinators, capable of achieving a high degree of intensity and effectiveness of competition. Recently, for example, they disseminated the work experience of Gds Maj A. Saberov, commander of an excellent-rated detachment, in organizing and holding socialist competition directed toward consummate mastery of aircraft equipment and weapons, at boosting the combat proficiency level of aircrews, and at

maximum utilization of the tactical and technical performance capabilities of an aircraft and its weapons systems. The detachment commander works a great deal with his men, studying their individual qualities. This helps him see the prospects for the combat, political and moral/ethical growth of each individual. Aviation personnel are thoroughly familiar with what specific performance indices they are seeking to achieve during each flight operations shift, day and night, in various weather, in order to make the greatest personal contribution toward increasing the subunit's combat readiness. In this outfit the word of aviation personnel is backed up in full measure by deeds: the subunit is top-ranked in socialist competition.

Positive experience in increasing effectiveness of competition has been amassed by the party committee of the regiment under the command of Gds Lt Col A. Shershnev. The members of the party committee, skillfully utilizing moral incentives, the method of persuasion, and strict accountability, seek to ensure that Communists play a vanguard role in accomplishing adopted pledges. Reports by CPSU members on this matter are regularly presented at party committee sessions and party meetings, deficiencies are revealed, and ways to correct them are specified.

The experience of vanguard units convincingly attests to the fact that well-organized socialist competition plays an important role in a military outfit's daily life and affairs and is an effective means of improving combat performance levels and indoctrination work with personnel.

At the same time, however, in spite of experience amassed in organizing socialist competition, its potential is not yet being fully utilized in the area of increasing combat readiness and effectiveness of personnel training and indoctrination. Some commanders, political workers, staff officers, party and Komsomol activists have not yet gotten rid of inertia and excessive attention to form with detriment to content in their activities. Sometimes methods of organizing competition fail to meet practical demands and have not been subjected to substantial refurbishing and restructuring taking into account the increased complexity of tasks being carried out in connection with a further increase in the complexity of the military-political situation. A comprehensive approach to organization of competition, which comprises the essence of the requirements of the CPSU Central Committee decree entitled "On Improving the Organization and Practice of Totaling Up Socialist Competition Results and Rewarding Competition Winners" is not being fully secured.

As we know, a comprehensive approach presupposes first and foremost that each military collective and each serviceman draw up and adopt specific pledges. Ensuring that they are sufficiently tough but realistic is one of the most important aspects of directing competition. It sometimes happens, however, that performance levels specified by an outfit fail to exceed performance targets assigned to that unit or subunit or already achieved results.

Analysis of group and individual pledges indicates that at times they are vague and nothing more than words of pronouncement, poorly reflecting the specific directions of combat training and job-related duties. As a result socialist competition to increase the effectiveness of the training and indoctrination process to shorten the time required to meet basic combat work

performance standards, to achieve high-quality accomplishment of combat training tasks, and for extensive engagement in efficiency innovation and invention activities does not always experience development.

A great deal of experience has been amassed in the Air Forces in the area of organizing socialist competition for high-quality mastering of new aircraft and weapons. In some outfits, however, it is not being fully utilized and does not always fully conform to the requirements of the slogan "A Higher Level of Mastery of New Equipment." In particular, this is expressed in insufficiently precise organization of competition for establishing appropriate training facilities.

Experience amassed by vanguard units and subunits in organizing competition on combat training tasks and performance standards, especially in flight operations, in the course of training activities and work on equipment, is being inadequately utilized in some units.

We cannot ignore these deficiencies. It is important that persons engaged in competition feel responsibility for meeting their socialist pledges, for effectiveness of competition is determined precisely by desire and ability to set for oneself a high goal and to achieve that goal.

The above-mentioned CPSU Central Committee decree stresses that competition will be effective if the requisite organizational-technical and social conditions as well as conditions of daily living routine area created, promoting the meeting of pledges, exemplary performance of job-related duties, and conduct of the training and indoctrination process. But these demands are not always met. Many times specific competition targets are not spelled out by performance levels, month and week. The practice of totaling up competition results also suffers from serious deficiencies. Awarding excessive performance marks to flight personnel for flying technique, combat employment, and in commander training subjects has a particularly negative effect. An inadequately aggressive campaign is being waged against carelessness, negligence, and conceitedness in flying activities, as well as loss of a feeling of responsibility for the successful outcome of each training sortie. Aviation engineer service supervisor personnel are not doing everything possible to improve process discipline in the preparation and servicing of aircraft. It frequently happens that instances of unsatisfactory preparation and maintenance of equipment lie hidden behind an overall high percentage figure for excellent-rated aircraft. Nevertheless these deficiencies are frequently not taken into consideration in determining excellent performers and competition winners. With shortcomings of this kind it is difficult to achieve a high degree of effectiveness of competition.

One should enhance even further the role of headquarters staffs and services in socialist competition, in seeking and finding possibilities for improving quality and increasing effectiveness of the training and indoctrination process.

A comprehensive approach to competition implies comprehensive ideological support of the competition process. It was emphasized at the All-Union Scientific and Practical Conference "Improving Developed Socialism and Party

Ideological Work in Light of the Decisions of the June (1983) CPSU Central Committee Plenum" that this presupposes the conduct of extensive mass-political work to explain the role, tasks and content of competition, to enhance its sociopolitical and educational role, publicity and comparability of results, skilled application of moral and material incentives, purposeful, content-filled publicity and adoption of advanced know-how. In Air Forces units and subunits a great deal is being done to utilize the educational potential of socialist competition. It has begun actively influencing relations between servicemen, their moral/ethical improvement, and development in personnel of excellent spiritual/intellectual, moral-combat, and psychological qualities. Basic forms of ideological and mass-political work as well as political instruction are directed toward this end.

It is essential, however, to place higher demands on ideological work in this area. One's attention is drawn first and foremost by the fact that in some outfits Leninist ideas and principles of socialist competition, the party's demands on development of activeness and initiative by the masses as well as unity of word and deed in achieving top performance indices in military labor are insufficiently purposefully publicized and clarified.

There is noted in some outfits a slackening of attention toward one of the main Leninist principles -- securement of extensive publicity. Sometimes the men in a unit or subunit do not know who is a competition winner or what his performance results were. Nor should one forget another aspect of publicity -- critique of lagging-performance individuals and persons who lack a conscientious attitude toward the job at hand.

Closely linked to publicity of socialist competition is another principle of its organization -- comparability of results. Guided by this principle, it is essential fully to take into account the true state of affairs on the part of competition rivals, carefully to analyze their achieved performance results, and conformity between results and stated performance goals. This must also be promptly reflected in mass agitation work and visual publicity materials.

Precisely-organized competition provides the opportunity to emulate in a practical manner and widely publicize advanced know-how. On the whole this task is being successfully accomplished. But deficiencies have not yet been eradicated in some outfits. Training classes, lectures and presentations by propagandists and agitators give little attention to the achievements of competition leaders, and display stands featuring competition leaders are updated with considerable delay.

One must also note the fact that at times well-proven forms of moral and material incentive reward for competition winners are forgotten or are not utilized in full measure, and a collective rarely resorts to moral censure of lagging performers and individuals who are unconscientious about the task at hand. This diminishes the pedagogic aim of competition.

Figuring prominently in the CPSU Central Committee decree entitled "On Improving the Organization and Practice of Totaling Socialist Competition Results and Rewarding Competition Winners" is the demand that primary party organizations work persistently to influence the entire process of

competition, in particular making every effort to enhance the vanguard role of CPSU members and the responsibility of leader-communists for the end results of competition.

We know what an outstanding opportunity participation in competition offers Communists to display sociopolitical activeness and initiative. Constituting a synthesized expression of the leadership role of party members is conformity between their deeds and the demands made of an excellent performer in combat and political training. And the overwhelming majority of party member aviation personnel consider precisely this to be their priority task and display a personal example in military training and discipline.

But one also encounters instances where some party members fail to meet socialist pledges several years running, fail to be competition leaders, and fail to be trailblazers of the new and progressive. As a rule this happens wherever activeness and demandingness of party organizations is low. Some party committees and buros rarely receive reports and summaries by party members on performance of their personal socialist pledges and on participation in organizing competition among subordinates. The party organizations in which Comrades V. Chelnokov, N. Morozov, and V. Grigor'yev work contain precisely such shortcomings.

We cannot accept such a situation. Party activists must display greater efficiency, innovativeness, and persistence in their work and must learn maximally to utilize the mobilizing and educational force of competition and to secure a vanguard role by Communists in competition.

This also applies in full measure to All-Union Komsomol organizations in the Air Forces. USSR Minister of Defense MSU S. L. Sokolov stressed in his address at a Komsomol conference of the Red-Banner Turkestan Military District that extensive opportunities for improving combat proficiency and discipline as well as for innovative activeness and initiative by Komsomol members in socialist competition are offered by implementation of the demands of the CPSU Central Committee decree entitled "On Further Improving Party Leadership of Komsomol and Enhancing Its Role in Communist Indoctrination of Youth" and by implementation of the recommendations of the 5th Armed Forces Conference of Secretaries of Komsomol Organizations.

A great deal of work is being done in Air Forces units and subunits aimed at implementing the demands of the USSR Central Committee, USSR minister of defense and chief of the Main Political Directorate of the Soviet Army and Navy pertaining to intensifying and increasing the effectiveness of socialist competition. A good deal still remains to be done, however. It is essential first and foremost to assimilate the fact that the most important condition for effectiveness of competition is recording and verification of attained results. V. I. Lenin constantly reiterated that one condition for implementation of the idea of competition is "organization of practical recording and verification," the main objective of which is to ensure that "word is transformed into deed." This demand is particularly relevant today.

Commanders, political workers, party and Komsomol organizations must devote greater attention to the so-called middle achievers, that is, those who are

not among the lagging performers but who also do not make the effort to achieve higher performance levels in military training and who avoid volunteer work. "Here lies our reserve potential, and a considerable one at that," emphasized Comrade K. U. Chernenko in his address at a meeting of the CPSU Central Committee Politburo last November. The task consists in ensuring that each and every "middle achiever" joins the ranks of socialist competition vanguarders.

Leader-communists and the organizers of the training and indoctrination process should bear in mind that socialist competition is continuously developing and improving. General party practical experience vividly attests to this fact. It is essential to gain a firm understanding of the party's present-day demands, to gain a mastery of advanced methods of working with others, and to have an innovative attitude toward the job at hand. Herein lies a guarantee of strengthening of the mobilizing and educating role of the patriotic movement in high-quality performance of assigned tasks and further strengthening of military discipline in the year of a worthy honoring of the 40th anniversary of the Great Victory and the 27th CPSU Congress.

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AIR FORCES PREPARE TO CELEBRATE 40TH ANNIVERSARY OF MILITARY VICTORY

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 4-5

[Article, published under the heading "115th Anniversary of V. I. Lenin's Birth," by Candidate of Philosophical Sciences Lt Col L. Belov: "The Vital Power of Great Ideas"]

[Text] The birth and development of the Soviet Armed Forces are inseparable from the name of V. I. Lenin, ingenious leader of the proletarian revolution. The entire history of our socialist homeland is linked with his teaching. In addition, the following mechanism is being manifested today with increasingly greater distinctiveness: the more swiftly social advance occurs, the more rapidly the social countenance of our planet changes, the more vividly is revealed the vital power of Lenin's ideas.

The Great October Socialist Revolution became mankind's first step on the road toward a society which organically repudiates social injustice, violence, and war. Therefore the fact that the first legal enactment issued by the Soviet State was Lenin's Peace Decree was a profoundly logical phenomenon. Socialism and peace are inseparable. The 26th CPSU Congress stressed that the policy of peaceful coexistence is exerting increasingly more determining influence on contemporary international relations. As long as there continues to exist a threat to the achievements of socialism, however, our steps toward peace should be accompanied, the leader of the proletariat pointed out, by an intensification of all our military preparedness; we must be on guard and fiercely protect the defense capability of our country and our Red Army.

The Preamble to the Decree on Organization of the Workers' and Peasants' Red Army, signed by V. I. Lenin on 28 January 1918, emphasizes the objective necessity and historical logic of establishment of a socialist army. A profound and comprehensive economic and political analysis of imperialism comprises the foundation of Leninist teaching on defense of the socialist homeland.

V. I. Lenin presented such a genuinely scientific analysis of the essence of imperialism in his work "Imperializm, kak vysshaya stadiya kapitalizma" [Imperialism as the Highest Stage of Capitalism], which was published in 1916, as well as in a number of other writings. The theory of imperialism which he

formulated constituted a most momentous contribution to Marxism and a new stage in its development.

Vladimir Il'ich revealed the objective trends and mechanisms of the phenomena of imperialism and painstakingly traced the emergence and development of the principal features and attributes of monopoly capitalism. He revealed with a vast breadth of material the profound contradictions of imperialism and demonstrated that it is characterized by omnipotence and dominance by finance capital and monopolies and that a totally reactionary policy is a political feature of imperialism. Proceeding from the results of his analysis, Vladimir Il'ich reached the conclusion that the world capitalist system as a whole had become ripe for revolutionary reorganization and that imperialism represents the eve of social revolution.

But V. I. Lenin did not limit himself to this general conclusion. In his subsequent writings he subjected to detailed examination the actual state of affairs in various countries, particularly in Russia. Analysis of the concrete situation enabled him to discover the law of nonuniformity of economic and political development of capitalism in the period of imperialism. It followed from this that the victory of socialism was possible initially in a few or even in a single separate capitalist country. This conclusion signified that the collapse of capitalism would constitute an entire series of class battles taking place throughout the span of a historical era. And as we know, the course of world history has confirmed the correctness of Lenin's foresight.

V. I. Lenin explained in his writings that victory of the proletarian revolution initially in several countries or even in a single country, with capitalism or precapitalist relations preserved in the remaining countries, would cause not only friction but an outright endeavor on the part of the bourgeoisie of other countries to crush the victorious proletariat of the socialist state. It logically followed from this that the proletariat should also have its own military organization in order to hold and consolidate socialist gains.

The theoretical conclusions reached by the great leader were fully confirmed in practice. The flame of civil war blazed up over vast expanses of our country from the very first days following establishment of Soviet rule. In these conditions the Bolshevik Party and V. I. Lenin considered organization of the country's armed defense to be the only correct way to ensure its security. "No revolution," stated Vladimir Il'ich, "is worth anything unless it is able to defend itself."

It was essential to establish a strong, strictly disciplined regular army of a new type in the shortest possible time. And such an army was in fact established on the basis of Lenin decrees. The basic principles of organizational development of the armed forces of the socialist state were laid out in these first documents: the class, proletarian character of the army of a new type, its close unity with the people, and the guiding role of the Communist Party in the area of military organizational development.

A significant position in the military activities of V. I. Lenin was also occupied by matters pertaining to organizational development of the Air Forces and guidance of their combat operations. Already at that time, when airplane flying was treated as a recreational diversion, he foresaw a great future for aviation and noted its military and economic significance.

Documents pertaining to organization and formation of the first military aviation units, training of personnel, development of scientific and experimental design activities, manufacture of aircraft, engines, and other matters attest to Vladimir Il'ich's attention to and concern for aviation. The first aviation detachments which were formed not only laid down the foundation of the Red Air Force but also made a worthy contribution toward defeat of the forces of foreign military intervention and domestic counterrevolution.

History has confirmed time and again the correctness of one of the most important theses of Marxism-Leninism, to the effect that the bourgeoisie will never voluntarily consent to yield power to the toilers, that it will endeavor at all costs to strangle the revolution.

For almost four years we were engaged virtually in single combat against well-trained and armed fascist hordes which were pursuing the aim of destroying socialism in the USSR, seizing our national wealth, and enslaving our people. The outcome of the war was predetermined not at all by the combat operations of the allied Anglo-American forces in North Africa and Italy, as today bourgeois falsifiers of history are attempting to argue. The fate of the war was decided precisely on the Soviet-German front, by the selfless, courageous struggle of the Soviet people, who displayed mass heroism, and by the might of Soviet arms. The victory was due to our socialist system.

The names and deeds of many intrepid air warriors are entered in golden letters in the heroic chronicle of the war. Out of fascist aircraft losses totaling 77,000 on the Soviet-German front, Soviet military aviation destroyed 57,000 enemy aircraft on the ground and in the air.

This year aviation personnel combat training is taking place in an atmosphere of nationwide preparations for celebration of the 40th anniversary of our Great Victory and the 27th CPSU Congress. The results of the Great Patriotic War demonstrated in a most persuasive manner that there are no forces anywhere in the world which could crush socialism and bring the Soviet people to its knees. These results constitute a stern warning to the imperialist aggressors and serve as a severe and unforgettable lesson of history.

The victory of the Soviet Union in the Great Patriotic War predetermined in large measure the entire course of postwar development in the world. The establishment and development of a world socialist system, competition and struggle between the two systems have led to a narrowing of the sphere of territorial domination by capitalism and a sharp change in the correlation of forces in the world. This is attested in particular by figures on industrial output growth. For example, the percentage share of the socialist countries in world industrial output as a whole has climbed from 10 percent in 1940 to more than 40 percent in 1984. All this is of paramount significance not only

of itself but also is greatly affecting the fundamental internal processes taking place in the capitalist world, is influencing the operation of many mechanisms which are internally inherent in capitalism and is resulting in increasing the reactionary nature and aggressiveness of imperialism.

Imperialism is a rotting and parasitical society. This feature is most vividly manifested today in militarization of all domains of societal affairs in the capitalist countries. The militarism and arms race engendered by it are fraught with the direct threat of unleashing of a nuclear world war by the imperialists and are devouring society's wealth to an ever increasing degree, demanding vast expenditures of raw material, energy, and labor resources. A sharp escalation of the arms race is leading to the unchecked, steadily growing amassing of implements of death and destruction. Suffice it to say that today every 20 minutes there is produced in the world a bomb equal in power to the one which was dropped on Hiroshima in 1945. This confirms Lenin's conclusion, stated in the volume "Imperialism as the Highest Stage of Capitalism," to the effect that politically imperialism is basically a tendency toward violence and reaction and that there does not and cannot exist a peaceful imperialism in any form.

Naturally the essence of imperialism has not changed during the years which have passed since the beginning of the present century, but practical realities have introduced new elements into its basic features. Transnational state-monopoly capitalism began to form on the basis of a coalescing of transnational corporations with the state and unified intergovernmental bodies, transnational military-industrial complexes appeared, and international alliances of the most reactionary political circles became consolidated.

These processes have also dictated the appearance of new features in the content of militarism. V. I. Lenin pointed to the possibility of unification of efforts of imperialist states in the struggle against the forces of social advance. He emphasized thereby that such an alliance "is possible and is observed not only in the form of economic coalescing of finance capital... but also in the form of military 'collaboration' in an imperialist war." Such a unification of international imperialism is incapable of achieving the postulated integrity in the military domain. It can exist chiefly due to force and subjugation of the weak, as V. I. Lenin noted in "Imperialism as the Highest State of Capitalism." Failure to consider the genuine danger presented by joint military preparations by the international monopoly bourgeoisie, however, means failure to see the enormous danger which today threatens all mankind.

International imperialism has transitioned to practical actions aimed at implementing programs calling for achieving military superiority. The deployment of "Euromissiles," a sharp increase in spending by Washington on military "development" of space, accelerated development of satellite-killer weapons, as well as projects for the development of laser weapons all attest to the fact that imperialism is accelerating material preparations for a world war.

Pointing to the necessity of deepening and broadening resistance to the threat of imperialist war, V. I. Lenin wrote: "One might well devote one's life to the struggle against such a war. One must be ruthless in this struggle; all sophisms in its defense must be pursued to the very end."

Communists are fighting to preserve human civilization, but they are also fighting against oppression and for social justice, while a system grounded on exploitation and oppression is a system which engenders the threat of nuclear war. Therefore the problems of war and peace, points out CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, "do not exist of and by themselves. They are inseparable from worldwide social conflicts and from the development of the class struggle."

It was stressed at the All-Union Scientific-Practical Conference entitled "Improvement of Developed Socialism and Party Ideological Work in Light of the Decisions of the June (1983) CPSU Central Committee Plenum" that it is not us but capitalism which must maneuver and camouflage itself, resorting to wars and terror tactics, falsification, subversion and sabotage in order to hold in check the inexorable advance of the times. The general crisis of capitalism is not only an aggravation of its economic, social, and political contradictions. It is also a spiritual, ideological, and moral crisis.

Peace cannot be had from the class adversary merely for the asking: he can only be forced to accept peace. The forces of peace are more powerful than the forces of war. This assertion is grounded primarily on the international prestige, on the political, economic, and defense potential of the socialist nations. Their power, and chiefly the military might of the USSR, serves as a reliable material defense against any and all encroachments by imperialism.

The fighting men of the Air Forces pass on faithfulness to the Leninist ideals of defense of the socialist homeland from generation to generation, like a relay baton. Actively involved in socialist competition to honor in a worthy manner the 40th anniversary of the Great Victory and the 27th CPSU Congress, they are achieving additional successes in combat improvement, securing reliable defense of the productive labor of the Soviet people, the interests of peace and socialism.

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BRIEF TACTICAL DRILL AT THE SQUADRON LEVEL

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 6-7

[Article, published under the heading "Be Alert, In a Continuous State of Combat Readiness," by Maj A. Maslennikov: "Tactical Drill in the Squadron"]

[Text] In the course of a tactical air exercise the squadron under the command of Military Pilot 1st Class Lt Col B. Morskov was assigned a difficult mission. The aircrews were to deliver ammunition and food supplies to motorized riflemen operating beyond the "battle line." The mission involved flying over mountainous terrain at night in adverse weather. Another difficulty involved penetrating a screen of interdicting fire: the "adversary" was attempting to seal off the area in which our subunits were concentrated. The situation demanded of flying personnel skilled employment of effective tactical devices and proficient utilization of primary and backup navigation and aiming systems.

Proceeding under cover of darkness with boldness and determination, the aircrews successfully accomplished the mission. A model of professional expertise was displayed by Maj S. Novikov and Capts N. Aralin and V. Vyrskiy. The squadron received high marks from the director of the exercise.

This successful performance was logical. It had been preceded by intensive preparation. Lt Col B. Morskov is convinced that a high level of flying personnel tactical proficiency is one of the deciding factors in achieving victory over a powerful, well-equipped, crafty and cunning adversary. Therefore in the process of training his men he devotes considerable attention to their tactical preparation.

Various training activities are utilized in the squadron to accomplish thorough study of items of tactics and to develop solid knowledge and skills in carrying out assigned missions, with tactical letuchki [short exercise, brief drill] playing an important role. Lt Col B. Morskov always approaches their organization and conduct in an innovative manner. At brief tactical drills they not only work on standard maneuvers, which subsequently serve as a foundation in performing mock combat missions, but also adopt and incorporate, as needed and in a flexible manner, all progressive, vanguard innovations suggested by practical experience and which promote the further professional

development and combat maturation of aviation personnel. During these exercises pilots learn to make well-substantiated decisions in conditions of an acute lack of time, with limited and frequently contradictory data on the tactical situation. The squadron commander seeks to ensure thereby that these decisions are not only thoroughly thought-out but also carefully calculated and modeled, so that a pilot can demonstrate their feasibility and effectiveness.

The experience of this and other aviation subunits indicates that it is advisable to hold a brief tactical drill following study of a specific, generally the most complex training class topic or aggregate of topics in order to reinforce studied material and to acquire solid skills. It is conducted in a limited period of time. One or two training topic items are worked on, as a rule connected with accomplishing tactical missions which are to be performed in the course of flight operations. Training activities are organized in the classroom, at the command post, or at the airfield.

It is a relatively uncomplicated matter to hold a brief tactical drill. But it produces the desired result only if the individual in charge has prepared well for it. The principal stage of this work is formulation of the scenario and plan-schedule for conduct of the exercise.

The scenario is in conformity with the topic of the drill and its training objectives. It is not drawn up as a formal document, but it constitutes the basis for formulating the plan-schedule for conduct of the exercise. A complex tactical environment is created for the purpose of implementing the main principle of combat training -- to teach troops that which is essential in war -- and the exercise is subsequently carried out against this background environment. A general sequence and procedure of actions by the "adversary" is worked up, as well as possible tactics and modes of countermeasures, by the aircrews. Decisions for the aircraft commanders, to an extent essential for full elaboration of training topic items, are worked out in conformity with the "adversary's" general plan of action.

The subject matter of brief tactical drills conducted in the squadron is highly varied. It mandatorily contains, however, problems the solving of which requires of the trainees initiative, innovative thinking, independence, and flexibility in situation assessment and decision-making. The depth of elaboration of topic items addressed at such an exercise, the current relevancy of the items being worked on, activeness on the part of the trainees, as well as a thorough, substantive analysis -- this is what promotes the effectiveness and instructiveness of such activities. And all this is dependent on the person in charge of the exercise and his innovative approach to things.

The plan-schedule of the brief tactical exercise, which constitutes the principal (and sole in most cases) document in the conduct of such an exercise, greatly assists the exercise director. As a rule, in the squadron the plan-schedule is drawn up textually in the form of a table-schedule.

This document is signed by the exercise director and approved by his immediate superior. The plan-schedule can be drawn up with a varying degree of

detailing, but in all cases it indicates the topic, training objective, time, place, and sequence of conduct of the exercise.

In addition to the plan-schedule for conducting a brief tactical drill, a mission task for the trainees and a map or chart for the director may be drawn up. The task assignment is drawn up for the purpose of ensuring prompt and timely preparation of flying personnel for the drill. It consists of several sections (overall and specific situation environment, reference data, instructions on preparation). A director's map is prepared only if it will be necessary for the trainees to use it for decision making on the basis of scenario instructions.

Experience in tactical training indicates that intensification of the training process is one direction to take in increasing the effectiveness of training activities. Therefore it is essential to prepare a brief tactical drill so as to obtain maximum return on each minute of training and the entire drill. This difficult work demands of the exercise director a feeling for the new, innovative search, initiative, and persistence.

The exercise director should devote special attention to preparing and formulating scenario instructions, as is the case, for example, with Lt Col B. Morskov. The scenario instructions he gives his men reflect the combat work of aircrews at the most difficult phases of a flight and are distinguished by accuracy of formulation and brevity of expression. He seeks to obtain the same from his men, demanding a laconic, precise, and specific response. For example, the squadron commander teaches his men not only correctly to formulate responses but first and foremost to see behind these responses their actions, which should be vigorous, knowledgeable, and purposeful, for under no circumstances should there be slowness in today's air combat.

In preparing for a brief exercise the director selects interesting, instructive situations grounded on profound knowledge of the tactics of the potential adversary and the capabilities of Soviet aircraft. The squadron maintains a record of situations which have occurred in the course of scheduled flights, tactical air exercises, and in other instances when aviation personnel had difficulty in making an optimal decision. Such tactical problems are usually presented at a brief tactical drill.

Work on training topic items included in a brief tactical drill begins following the exercise director's introductory commands. Projection equipment is widely utilized in this squadron to depict the initial situation, to present scenario instructions and to display individual episodes of a mock combat mission. After the scenario instructions have been presented, the trainees are given time for situation estimation and decision-making, but with the proviso that the pace of execution of the exercise is in conformity with an intense, realistic course of events. Responses are presented in the form of decisions or reports.

In the course of a brief tactical drill Lt Col B. Morskov endeavors to create an environment which helps develop in aviation personnel intelligent initiative and a sense of responsibility in reaching a given decision. He does not permit monotonous, predictable-routine actions by his men in the

process of training drills, and he does not reject their decisions without adequate grounds. But if these decisions are too contradictory or conflictive, in summarizing performance results he persuasively shows the positive and negative aspects of each decision and suggests to the men an optimal variation of actions in the given situation. A model formulation of a decision by the exercise director is an effective teaching method, since in this instance the men obtain a better grasp of it and gain a specific, correct idea about it.

The most interesting, unique variations, bolstered by calculations, which pilots present at brief tactical drills are frequently discussed later in the unit methods council and, after being tested in the air, are given the green light, as they say.

Situations which cannot always be created in the course of scheduled flight or tactical air exercises are also examined and developed at brief tactical drills in this squadron. But they may arise in an actual combat situation. Experience amassed by officers B. Morskov, S. Novikov, N. Aralin, V. Vyrskiy and others in performance of their internationalist duty as members of the limited contingent of Soviet forces in the Democratic Republic of Afghanistan indicates that if an aviator has gained a thorough understanding of the theoretical foundations of the topic items presented at a brief tactical drill, he will perform with precision, confidence, and flawlessly in a complex air and weather situation.

A brief tactical exercise ends with the men submitting their calculations, combat documents and decisions in written form (graphically) or with presentation of oral reports on their decisions and actions. Written or graphic answers are first checked by the individual in charge and are subsequently analyzed and critiqued. Oral responses are evaluated at the end of the drill, at the schedule-specified time.

The critique of the brief tactical drill is of considerable educational significance. The director prepares for it during the entire exercise, noting all positive and negative elements in the men's training.

A thorough analysis of the actions of aviation personnel in response to scenario instructions and an instructive discussion on the results of the brief exercise are of great educational significance and constitute an important condition for further improvement of their combat proficiency. In totaling up results the exercise director does not merely enumerate individual negative and positive elements but analyzes in a skilled manner the actions of each trainee or at least those who submitted fundamentally differing solutions.

The totaling up of the results of a drill commences as a rule with a disclosure of the basic theoretical points of the topic in question. The exercise director then lays out the training objective and appraises the performance of each trainee, skillfully analyzing the most competent solutions and typical mistakes. At this point he strongly directs attention to the specificity, clarity, and completeness of presented solutions, to strongly active efforts on the part of the trainees, the state of discipline at the

exercise, the officers' ability to perform tactical calculations quickly and accurately, and their knowledge of guideline documents.

At the end of the critique the instructor determines the degree to which the drill objectives were attained and indicates what items must be additionally worked on and studied, and allocates the requisite time for this.

As is shown by the experience of this and other vanguard subunits, the effectiveness and quality of a brief tactical drill is directly dependent on the method of its conduct. A methodologically correctly organized drill actively fosters further improvement in the tactical proficiency of aircrews, essential for maintaining a continuous state of readiness of aviation subunits to perform combat missions. One should bear in mind, however, that any tactical training drill, including a letuchka, just as tactics proper, do not tolerate stagnation, predictable routine, unnecessary situation simplification, or excessive attention to form with consequent detriment to content. One can only adopt as a basic foundation the above-described method and scheme of a brief tactical drill. The more diversified are the forms and methods of its conduct, the greater the benefit from the exercise, for brief tactical drills develop the tactical thinking of aviation personnel and lay down the foundations for them to achieve success in the complex conditions of modern air combat.

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CAMPAIGN FOR LAW OBSERVANCE, ENDING OF THEFT, ABUSES LAUDED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 10-11

[Article, published under the heading "The Army's Strength Lies in Discipline," by Maj Gen Justice B. Popov, deputy chief military prosecutor: "Taking Ethical Criteria Into Account"]

> [Text] In recent years we have assiduously proceeded to set our house in order, so to speak. The task is precisely formulated: to put an end to bribery and profiteering, squandering and theft of socialist property, and to abuses of office. We have sharply stepped up the campaign to strengthen rule of law, to improve the operations of our law enforcement agencies, to increase the responsibility of ranking officials, and to achieve overall organization and discipline."
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> From address by CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, at the All-Union Conference of People's Inspectors

Our country's toilers, boosting the efficiency of socialist production, are making every possible effort to increase the economic wealth of the homeland and to strengthen its defense capability. In every area they are showing a stewardly good-management attitude toward socialist property and are taking pains to safeguard it. Outstanding patriotic qualities have been developed in Soviet citizens first and foremost due to the daily purposeful ideological-indoctrination activities on the part of the CPSU, directed toward forming a new man and affirming in our society the principles of Communist ethics and morality.

In our country there are no and can be no social causes impelling people to live at the expense of others. Nevertheless, however, one still encounters those who seek to give as little as possible to the state and to take as much as possible from it. A philistine psychology is manifested in this. And as

we know, such qualities as selfishness, greed, and indifference toward the affairs and concerns of others appear on its soil.

The present stage of development of the socialist society requires an all-out strengthening and, in addition, a toughening of monitoring of measure of labor and measure of consumption. It was clearly emphasized at the 26th CPSU Congress that "it is necessary to use all organizational, financial, and legal means to shut solidly all avenues for parasitism, bribery, profiteering, nonlabor income, as well as any and all encroachments on socialist property."

In recent years the CPSU has done a great deal toward the consolidation of socialist humanism and the creation of a healthy moral atmosphere in the Soviet society. As we know, however, all-forgivingness and an indifferent contemplation of social evil are alien to socialist humanism. On the contrary, it organically incorporates integrity, civic honesty and courage, firmness in overcoming immoral, antisocial manifestations, and intolerance toward them. Here too not only the law should be our ally, but first and foremost conscience, a high degree of responsibility on the part of each and every member of society for the creation of a moral atmosphere in which it would be impossible to live other than by one's own financial means, ensuring that stealers of public property do not feel right at home wherever one still encounters elements of mismanagement and irresponsibility, where there has been a slackening of political indoctrination effort.

Experience indicates that if commanders, political workers and party organizations constantly engage in indoctrinating people and hold the negligent and remiss strictly to account, things go better in that subunit, and public property is reliably protected.

Bourgeois criteria pertaining to the prestige element of consumption and selfish, petit-bourgeois acquisitiveness are unacceptable to our society. Not only the volume and pace of growth of the economy but also a steady rise in people's living standards attest to the advantages of the Soviet governmental and societal system. In this country we see an increase with each passing year in allocations for the development of culture, education, improvement of social security, expansion of the scale of housing construction, etc. A man of labor in the USSR is the genuine master of his land, a full and equal participant in running the affairs of state, society, and production. Soviet citizens do not experience the fear of losing their job. Their internationalist unity, fraternal mutual assistance and cooperation, social optimism and humanism are dictated by the very nature of our society. These features fundamentally distinguish it from the world of exploitation and oppression. This is also a genuinely new quality of life, which man is guaranteed by developed socialism.

At the dawn of Soviet rule, however, V. I. Lenin warned of the danger of the petit-bourgeois consciousness retained in a certain segment of the people, as well as the difficulties of smelting it into a qualitatively new social human alloy. The leader's instructions are relevant today as well. Although with the building of socialism in the USSR private ownership as an objective source of petit-bourgeois psychology has been relegated to oblivion, this does not mean that an era of universal prosperity has commenced. Unfortunately

consolidation of the features of the Soviet way of life is being carried out in a difficult, tenacious and painstaking struggle to overcome vestiges of private-ownership psychology, which was taking root in the consciousness of the masses over the course of many centuries of existence of an exploiter system.

In present-day conditions the party is devoting serious attention to the moral and legal education of the Soviet people and to an effective struggle against private-ownership psychology in the consciousness of a certain category of individuals. This work is grounded on strict observance of socialist rule of law and on the principles of Soviet democracy. Rule of law and democracy are interdependent in our socialist society, mutually augment and enrich one another. As social phenomena they reflect the unified process of development of the Soviet State and are directed toward strengthening the Soviet societal and governmental system and toward a struggle against vestiges of the past in people's consciousness and conduct as well as their education in a spirit of Communist ethics and morality.

We should take an example from V. I. Lenin in observing rule of law. When occupying the high position of Soviet head of state, Vladimir Il'ich always displayed an example of unswerving observance of the law. He resolutely combated even the slightest attempts to disregard the provisions of the law and sharply emphasized the importance of a personal example by party members, particularly leader-communists. V. I. Lenin devoted a great deal of effort toward increasing their feeling of responsibility for observance of Soviet laws, increased awareness of the law and cultural level on the part of our people, and endeavored to enlist toilers extensively in lawmaking activities.

Leninist principles of socialist rule of law became the foundation of all subsequent activities by the CPSU and Soviet State pertaining to strengthening legal order and intensifying the campaign against law violations. V. I. Lenin's teaching on socialist rule of law and our party's policy line directed toward its further strengthening are most fully reflected in the Fundamental Law of the Union of Soviet Socialist Republics. Article 4 of the USSR Constitution states that the Soviet State and all its agencies operate on a foundation of socialist rule of law and guarantee the safeguarding of legal order, the interests of society, the rights and liberties of citizens. Governmental and public organizations as well as functionaries are bound and obligated to observe the USSR Constitutions and Soviet laws. Pursuant to Article 59, each and every Soviet citizen bears this same obligation, must respect the rules of socialist intercourse and bear with honor the lofty title of citizen of the USSR.

Soviet servicemen are also obliged in full measure to observe socialist rule of law rigorously and precisely. This is a component part of combat readiness of the USSR Armed Forces and the foundation for strengthening legal order and military discipline.

The provisions of the law define the various aspects of military affairs, activities and daily routine. Precise application of these provisions of the law helps ensure that the Soviet Armed Forces are a smoothly-functioning, precision organism. Military personnel are highly organized and disciplined

and perform in an exemplary manner their responsible assigned tasks pertaining to guaranteeing the security of our homeland and its allies.

Socialist rule of law in all agencies of government and in public organizations is ensured first and foremost by administrative officials/executive personnel. In our army this function is assigned to command personnel. The Internal Service Regulations of the USSR Armed Forces spell out the direct obligation of every commander to be an example and to demand of his subordinates unswerving observance of the USSR Constitution and compliance with Soviet laws.

But the right to give orders and of personal authority is an extremely responsible right. And it must be exercised ably, with party integrity, because formulation and issuing of an order or instruction and reaching a decision on a specific matter is an important aspect of a commander's activities. At the same time it is no less important for a commander (superior) to be constantly concerned with ensuring that his orders, instructions, and decisions are grounded on rigorous observance of Soviet laws. Competent command and control of subordinates and successful implementation of a commander's decision or plan is impossible without this. In order for an order to possess a high degree of moral and legal force, it must conform to the law. Otherwise an order is devoid of governmental-legal protection and is subject to unconditional revocation, while the person who issued it shall be made liable for those consequences which have resulted from its execution and for the moral and material loss sustained by society.

It is essential to bear in mind that legal acts by command authorities pertain to the most diversified aspects of combat and political training, organization of performance of duties, strengthening of discipline, indoctrination of personnel, utilization of military equipment, expenditure of funds, and consumption of materials. In preparing legal documents, officer-executors should ensure that they rigorously conform to laws currently in force. In this case the commander cannot limit himself merely to prescribing a document. It is his obligation to examine the content, carefully weigh every point and section, the need for and legality of prescribed measures.

The absolute majority of command personnel of Air Forces units and subunits proceed in conformity with the requirements in performing their administrative functions. They are characterized by a profound understanding of Leninist teaching on state and law as well as a responsible, party-minded attitude toward the assigned task. Completeness of utilization of authorities of office is combined in these officers with activities strictly within the framework of the authority they possess, and demandingness as prescribed by regulation with paternal concern for others, respect for their dignity, rights and legitimate interests.

A serious effort to publicize the provisions of the law and legal order is being conducted in the regiment under the command of Col N. Minakov. In this outfit leader-officers, together with political workers and military legal specialists, supported by the party and Komsomol organizations and legal activists, seek to ensure that each and every serviceman has a responsible attitude toward performance of his duty to the homeland, unify the military

collective, and create in it an atmosphere of intolerance toward any violation of regulations. Firm discipline, precise organization of the training process, and strict observance by officers of legal documents and the requirements of regulations contribute to the fact that this regiment has maintained a rating of excellent for 15 years in a row. Its personnel are preparing to honor in a worthy fashion the 40th anniversary of Victory in the Great Patriotic War and the 27th CPSU Congress.

But facts of a negative cast are encountered on the overall positive background. Analysis of legal practice indicates that some commanders at times still issue orders and instructions in violation of laws presently in force as well as other legal standards. The principal reason for this is poor knowledge of the necessary documents. Sometimes it seems to a commander that insignificant departures from the requirements of the law or regulations, particularly if they are dictated by good intentions, are quite allowable and harmless. But this is far from the case. Such "trifles" frequently cause a negative repercussion in the collective.

Some commanders, for example, give subordinates assignments unrelated to their job duties and wrongfully free them from performance of various duly-prescribed duties. The opposite also sometimes occurs: officers and warrant officers, under various pretexts, are wrongfully assigned to barracks duty and are subjected to evening roll calls, which naturally affects the men's mood and morale in the outfit.

We Communists must bear in mind the fact that in conditions of further aggravation of the class struggle in the world arena and sharp aggravation of the international situation, our ideological adversaries make every attempt to exploit such incidents to discredit Soviet rule of law and socialist democracy. It is important that Communists, political workers, party and Komsomol activists seek to ensure that each and every serviceman, in performing his constitutional duty to defend the homeland, safeguards socialist property, takes part in combating theft and wasteful squandering of state and public property, and makes every effort to help and assist the work of volunteer inspectors.

At the present stage of development of Soviet society, the Communist Party attaches great importance to further improvement in the activities of socialist oversight agencies. The All-Union Conference of People's Inspectors, held in Moscow in October of last year, was devoted to this important political issue. Participation in the conference proceedings by high-ranking CPSU and Soviet Government officials and an address by CPSU Central Committee General Secretary Comrade K. U. Chernenko, chairman of the Presidium of the USSR Supreme Soviet, stressed the particular significance of this conference. In his brilliant, profound speech Comrade K. U. Chernenko gave high praise to the activities of volunteer inspection agencies, pointed out specific ways to improve it, and emphasized the increasing importance of monitoring and oversight in present conditions, at the stage of developed socialism.

The volunteer oversight people accepted as a fighting program of action the instructions and recommendations contained in Comrade K. U. Chernenko's speech

and the tasks assigned to the volunteer oversight committees, groups, and posts. They see their duty in monitoring implementation of party and government directives, in more deeply seeing and analyzing the results of economic management, in order better to carry out their role in detecting and eliminating that which is in contradiction to the nature of socialism and at variance with its high principles.

At all stages of its development the Leninist Party has resolutely combated everything which is not in conformity with the socialist way of life and socialist morality. Today as well the task is clearly formulated: put an end to bribery and profiteering, squandering and theft of socialist property, and abuses of office.

We should note that recently there has been a sharp intensification of the campaign to strengthen rule of law, improve the work of law enforcement agencies, and to increase the responsibility of administrative officials, a general state of good organization and firm discipline.

In this work one should be guided by the demands of the party and instructions of its Central Committee, which view oversight and strict observance of socialist rule of law as a tested and proven means of improving the economic mechanism, strengthening organization and discipline, and increasing the feeling of responsibility on the part of Soviet citizens in all areas of building communism.

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TEACHING OFFICER CADETS POLITICAL INSTRUCTION SKILLS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 12-13

[Article, published under the heading "A Higher Level of Party Influence at Air Forces Higher Educational Institutions," by Col A. Bykov, head of socioeconomic area of study, Kaliningrad Military Aviation Engineering School, and Maj I. Drobinka: "Teaching Students Indoctrinator Skills"]

[Text] In present-day conditions, when the party is directing serious attention toward improving management and administration, organization and discipline, requirements on training of cadres are appreciably increasing. As was emphasized at the 26th CPSU Congress and the subsequent party Central Committee plenums, in work with cadres one should seek to ensure that politically mature and highly ethical persons, competent and with initiative, possessing organizing abilities and a heightened sense of the new, are placed in all areas of party, governmental, economic and cultural-educational activities. These points, stated in an article by Col Gen Avn L. Batekhin, military council member and chief of the Air Forces Political Directorate (AVIATSIYA I KOSMONAVTIKA, No 3, 1984), also apply in full measure to Air Forces officer cadres, active bearers of Marxist-Leninist ideology and socialist culture, the heroic traditions of the older generations, and bearers of party policy among the young defenders of the homeland. The article points out reserve potential in improving training of Air Forces cadres, notes deficiencies existing in this important matter, and gives recommendations which guide us in our work pertaining to training officers not only as knowledgeable specialists but also as skilled indoctrinators of their men.

Each year graduates of our military aviation engineering school, receiving duty assignments to Air Forces units and subunits, join the large body of party and Komsomol activists and the ranks of volunteer propagandists. The school receives good reports about many of them. Good things are being said, for example, about officers Ye. Abramov, V. Sudoplatov, A. Mokhov, S. Shelyakin, and others. Some are successfully leading political instruction groups, while others are heading subunit party or Komsomol organizations.

Unfortunately we also hear reports of a different nature, which state that some lieutenants possess poor knowledge of methodology of organizing and conducting ideological indoctrination work in the subunit, display passivity

in performing job-related duties and in military outfit community affairs. And in each individual case we endeavor to look into the matter in a thorough manner, to find the reasons behind various shortcomings, and to correct them.

Practical experience indicates that the best results are achieved by those instructors who approach teaching and indoctrination of cadets taking into account the guidelines pertaining to improving ideological work articulated at the 26th CPSU Congress and our party's June (1983) Central Committee Plenum, by he who innovatively and boldly adopts active forms of teaching, who works persistently to improve the teaching and indoctrination process together with commanders and political workers, subunit party and Komsomol organizations.

At the same time some instructors, in teaching the social-sciences subjects, have yet to free themselves of inertia, a propensity toward predictable routine and an uninteresting manner of instruction in the dissemination of knowledge. Such methods inevitably lead to separation of theory from practice and have an adverse effect on acquisition by future officers of skills in party-political work.

The school's political section and the party organization of the socioeconomics area of study have done a certain amount of work in this area. The political section received suggestions by instructors aimed at improving the system of teaching and indoctrination of enrolled cadets. Subsequently the matter was discussed at joint party meetings of the area of study and subunits, and at meetings of subject-methods groups with the participation of company and platoon commanders. The implemented measures have helped precisely formulate cadet individual performance targets covering the period of their tour of duty in line units and have helped improve political indoctrination work and the enlistment of young aviation personnel into mass-political work.

It was decided to expand the grass-roots body of activists, for example, in view of the fact that instilling indoctrinator skills in cadets begins in the subunits. Now in each training squad the duties of agitators and news bulletin leaflet editors are as a rule performed by two persons: one officially, and the other as trainee. This practice of assigning activists has also taken firm root in cadet performance of guard duty, during practical training activities on equipment and during training excursions to the airfield. As a result, during his years of training at the school, each graduate is given the opportunity to experience a fine school of mass-agitation work.

One of the most important ways to increase effectiveness of the training and indoctrination process is adoption of the problem teaching method. It helps officer cadets not only gain a deeper understanding of the content of the social sciences but also helps correlate them with practical realities, with today's practical tasks. Thorough preparation and innovative quest is required of instructors. Area of study instructors officers N. Artamonov, N. Boykin, V. Motorenko, N. Furtes, and V. Yavoysh are working consistently and determinedly to master this method and are effectively applying it in their classes. Each of them has devised a unique method of optimizing the teaching process. They consider to be one of the most important areas in their

activities maximum utilization of those possibilities in teaching which bring the greatest benefit, and they direct all their efforts toward achieving the end result: to ensure that officer cadets can successfully apply acquired knowledge in a practical manner. To accomplish this, they are taught to work independently with recommended literature, to formulate the structure of reports and research papers, to prepare them and give oral presentations.

A great deal has been achieved by Lt Col V. Motorenko, senior instructor of the socioeconomic subjects area of study. Vladimir Mikhaylovich is constantly improving his method of problem teaching as the most effective form of developing in officer cadets the ability to conduct party-political work. Utilizing diversified forms of teaching and indoctrination, this experienced instructor seeks to ensure that the officer cadets, in studying a subject, learn to see the succession of Leninist ideas in CPSU policy, find in Lenin's writings and party decisions a methodological foundation for forming indoctrinator skills, and develop innovative, analytical thinking. When presenting a lecture on the topic "The Essence of the Process of Communist Indoctrination," for example, Lt Col V. Motorenko immediately aroused the students' interest in it. He emphasized that the lecture material he would be presenting was of exceptional importance in the future officers' practical activities. The instructor further noted that in present-day conditions, when imperialism is escalating the arms race and stepping up psychological warfare with the aim of exerting a harmful effect on the consciousness of Soviet citizens, one should improve ideological conditioning, increase political vigilance, be uncompromising toward hostile, alien views, and skillfully expose the ideological sabotage of the class enemy. As a result the students assimilated well this important topic and became deeply aware of its relevancy.

Maj V. Yavoysh has amassed instructive experience in conducting classes and developing in officer cadets skills in propaganda presentations. At each class on history of the CPSU the instructor gives his students an assignment, in line with the current topic, to prepare a brief report on some current-events issue. A young historian school is operating at our school under his guidance. Cadets are given classes on selecting the proper literature and preparing written and oral presentations. In addition, they take active part in the All-Union survey expedition "Chronicle of the Great Patriotic War," and they do a considerable amount of military-patriotic work. Many Komsomol-member aviation personnel are taking part in the cadet research paper competition in honor of the 40th anniversary of Victory by the Soviet people in the Great Patriotic War of 1941-1945. Officer cadets Yu. Mel'nikov, A. Mikhaylov, and V. Gusev, for example, prepared interesting and content-filled presentations.

Cadets also learn to perform ideological and political-indoctrination work in a lecture course, at seminars and practical classes on party-political work, military education science, and psychology. Lectures on these subjects address problems of theory, the practical experience of commanders, political workers, party and Komsomol organizations of vanguard Air Forces units and subunits of the Red-Banner Baltic Military District and the school's top graduates. In preparing for and holding seminars and practical classes, instructors devote much attention to teaching students the ability to prepare

plan-schedules for party-political work, work by the subunit party and Komsomol organizations, an outline-plan for a lecture, presentation, and lively discussion by a political instruction group leader. All this develops in the officer cadets independence and the ability innovatively to approach organization and conduct of ideological and political-indoctrination work.

Many years of experience indicate, however, that lecture and seminar classes at the school should definitely be reinforced by a tour of duty by future officers in line units. It is precisely there, in a specific military collective, that cadets learn to apply their knowledge in a practical manner and acquire experience in indoctrination work. And we must state that the overwhelming majority successfully accomplish this task.

But there are also errors of omission in this area. First of all, in our opinion insufficient time is allocated to practical work in some subject areas. In the course entitled "Party-Political Work in the USSR Armed Forces," for example, we feel that more time could be devoted to instruction-methods classes at the school and to practical training activities in the unit.

Unfortunately it frequently occurs that some graduates of our school do not perform individual assignments pertaining to conducting practical training classes. For example, the tour of duty in line units was effective only for officer cadets S. Golubev, A. Mitin, V. Papadyuk, and S. Khoroshkin from the training squad under the command of Sgt N. Sivakov. One cannot say that it was set up more poorly for the remainder. Many of the officer cadets functioned as political briefing officers in squadrons and flights, conducted talks, studied and synthesized party-political work experience on one of the topic items recommended by the study area instructors. For various reasons, however, some were not called upon to test their preparedness for practical work in units as political instruction group leaders. Particular attention was focused on this during analysis of the results of tours of duty in line units, and in the current academic year it is planned to organize officer cadet practical training classes in a more well-thought-out manner and to improve contact with the units.

The effectiveness of tours of duty in units in reinforcing in officer cadets skills in the conduct of party-political work is determined in large measure by the level of guidance provided by commanders and political workers visiting line units. Unfortunately some officer-leaders fail to attach adequate importance to this. We explain to such individuals the error of their views, demand that they change their attitude toward such an important item, and demonstrate by examples that service school graduates should be armed with party propaganda and agitation methods and should possess consummate mastery of skills in organizing and conducting party-political work. Even minor flaws in the theoretical and practical training of graduates will inevitably have an adverse effect on their subsequent military service and on their efforts to unify military collectives, strengthen discipline and impose proper observance of regulations.

These are in our opinion the most typical problems pertaining to forming in future officers skills in the conduct of party-political work. We are

resolving these problems, utilizing both our own experience and that of comrades who have addressed this subject on the pages of this journal. The main area in forming in officer cadets skills in political and military indoctrination of personnel is scientific and purposeful planning of this work for the entire period of training at all levels (training squad, company, course), continuous improvement of the training and indoctrination process, and a close linkage between this process and practical experience and the activities of line units and subunits.

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FIGHTER PILOTS USE FREE TIME ON FLIGHT LINE FOR LEARNING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 22-23

[Article, published under the heading "Know-How of the Best Into the Combat Arsenal," by Military Pilot-Expert Marksman Lt Col A. Pochitalkin, aviation regiment chief of staff: "Innovative Approach to Training"]

[Text] Preparing successfully to complete the winter period of combat training, our unit's commanders and political workers, staff officers, party and Komsomol activists are mobilizing personnel for exemplary performance of military duty and for meeting socialist pledges made in honor of the 40th anniversary of the Victory of the Soviet people in the Great Patriotic War and to honor in a worthy manner the 22nd CPSU Congress. Aviation personnel are directing all their efforts toward tirelessly increasing vigilance and combat readiness. They are strengthening military discipline and endeavoring to accomplish all assigned tasks with excellent quality, in order fully to implement the party's demand that they be prepared at all times resolutely to repulse any aggressor.

Communists are fully aware of the fact that in combat improvement, to use Lenin's words, one must constantly proceed further and definitely achieve more. This is also demanded by today's complex international situation. Therefore today we are raising particularly incisively questions pertaining to further improving the quality and effectiveness of combat and political training. But how and by what means is success to be achieved? Where is reserve potential to be found and how is it to be put into action? Having analyzed the state of affairs, we reached the conclusion that one should look for the answer in further intensification of the entire training and indoctrination process, which in an aviation regiment presupposes more efficient utilization of training time.

We have for this purpose excellently-equipped classrooms for tactics and navigation, aerodynamics and armament, airframe and powerplant, radar and aircraft equipment, etc. Skilled utilization of training devices, various simulators, working circuits and models in these classrooms enables squadron commanders, their deputies and staff officers to prepare flying personnel, engineers and technicians for flight operations at a high professional and methodological level.

While seeking maximum return from training facilities in preparing for flight operations with modern fighter aircraft, we also concern ourselves with further improving facilities. A great deal here is determined by the creativity of efficiency innovators, their innovator quest and ability to devise and build devices which would make it possible to create during the training process an environment maximally approximating actual combat, to monitor and objectively to evaluate performance.

Active innovators Majs A. Nefedov and G. Kovalev, for example, designed and built a working-model gunnery simulator in the weapons classroom. It demonstrated its effectiveness when the pilots, on the eve of a tactical air exercise, rehearsed procedures with aiming equipment and weapon system, and subsequently scored hits on all targets at the range, earning the highest mark.

Nevertheless the main thing in increasing effectiveness of training facilities is the ability of unit commanders, staff officers, political workers and party activists to determine, promptly and taking into consideration improvement in aircraft equipment, the principal directional trends of various projects in upgrading display stands, diagrams and models.

It is a difficult but entirely solvable problem. And we are accomplishing this task daily. For example, our pilots keep a close watch on the periodicals and naturally consider in their activities all new developments appearing in the military aviation of the potential adversary. Recently, on the recommendation of the methods council, a team of efficiency innovators under the direction of Military Pilot 1st Class Maj N. Ibragimov upgraded a display stand in the tactics classroom which shows new NATO nation air forces reconnaissance strike systems. Military Pilot 1st Class Sr Lt Yu. Feoktistov, aviation engineer service specialists WO O. Skoryak and Jr Sgt V. Yarovenko took active part in this work.

Or let us take another example. Training classrooms in the regiment's technical maintenance unit headed by Maj A. Arkatov were an important aid in boosting the proficiency ratings of flying personnel, engineers and technicians. Well-equipped rooms, simulators, working models, and electrically-wired display stands serve as an efficient means of deepening professional knowledge and skills of military aviation personnel, and yet all this was lacking in the past. Training facilities were renovated through the efforts of leader-communists. A great deal of inventiveness and creative initiative in this important area were displayed by aviation engineer service officers V. Mikheyev, G. Fedorov, N. Stolbov and A. Plotnikov, warrant officers Yu. Krikunenko, Yu. Krivitskiy and P. Kovbasyuk, Soviet Army civilian employee P. Solomatin, and others. They upgraded classrooms and laboratories, equipped simulators and fashioned dozens of unique plotting boards, display stands, wired diagrams, and other visual aids, tailored to improved and upgraded aircraft. As a result training facilities now are distinguished not only by their maintenance emphasis but also by ease and convenience of utilization in the teaching process. There is nothing superfluous. This has greatly assisted in training high proficiency-rating specialists who possess a

consummate mastery of advanced techniques in maintaining third-generation aircraft.

Speaking of intensification of the training and indoctrination process and efficient utilization of each and every minute of training, we must mention a very important matter pertaining to beneficially utilizing time on the airfield for training purposes. This is essentially another important aspect of the problem under discussion. It consists in the fact that an airfield is not only a place where aircraft take off and land. It is at the same time a special classroom, and its potential must be fully and efficiently utilized.

I once visited a neighboring aviation unit. In this unit aviation personnel, when at the airfield, not only work on mastering flying expertise and hone their skills but also deepen their knowledge of theory. This is particularly essential today in order successfully to master modern aircraft and to fly in a difficult meteorological and air environment.

I believe that this approach to things is the most advisable, and here is why. Practical experience in organizing flight operations and tactical air exercises confirms that the theoretical knowledge obtained in lecture halls and classrooms is today no longer sufficient to accomplish the flight training program. In order fully to master modern aircraft and weapons and fully to utilize their vast capabilities, one must constantly deepen and add to one's knowledge of theory. Pilots work hard on this. On commander training days they acquire a great deal of useful knowledge, which is subsequently augmented in the process of independent effort. But this does not mean that all reserve potential and possibilities have been exhausted. We know that a pilot spends a good deal of time on practical activities. Consequently in the process of these activities it is necessary not only persistently and consistently to hone one's skills but also to work with determination to grasp theory.

In our unit pilot training at the airfield is organized in such a manner that it becomes for them a principal training classroom. Discussion of flight operations and performance of forthcoming missions in the air is conducted in the language of formulas, drawings, and diagrams, which is fully in conformity with today's demands on the educational level of trainees.

...Lt V. Minin taxied his supersonic fighter to the ramp. The young aviator had taken his first flight to the practice area to practice advanced maneuvers. Some time later his flight commander, Capt M. Spiridonov, had the flight recorder tapes. Making a preliminary analysis of the tapes, he noted that in executing one of the maneuvers Minin had dropped his airspeed below minimum allowable. Was this a chance occurrence? Evidently not, the commander reasoned, because Lt N. Potselovkin had made almost the same error on a previous flight operations day. This meant that there had been an error in the training methods employed with the flight's young pilots.

Spiridonov shared his observations with the squadron deputy commander, Military Pilot-Expert Marksman Maj V. Khlebovich. The latter carefully studied the flight recorder tapes and came to the conclusion that the flight commander was right: both young pilots had made the same error. The reason

for the error was the fact that load factors had not corresponded to the calculated figures.

Thus it became necessary to have a talk with the squadron's young pilots right at the airfield. Major Khlebovich, an experienced combat pilot and methods specialist competent in theory, traced out on a portable blackboard the maneuver trajectory path, then sketched a diagram of forces and wrote out an equation of motion. After this he performed the necessary calculations by analytical method and plotted a load factor curve. The analysis was brief but graphic and convincing. The lieutenants gained a clear grasp of the reason for the errors.

But what about Captain Spiridonov? This young commander in turn received a graphic lesson on how pilots should be taught theory.

Today during flight operations in our unit one can frequently observe the following scene. After completing a training flight in a two-seater, the instructor is telling something to the pilot, explaining, drawing curves with a pebble right on the concrete ramp. The discussion continues in the pilot briefing shack, where other aviators also take part in the conversation.

But sometimes things happen differently. Frequently in the course of flight operations pilots think of interesting, sometimes disputable points of theory, which they are unable to resolve alone. They need an explanation by a competent specialist, who could talk to the pilot in the interval between training sorties. An engineer is not to be found in the pilot lounge, but on the flight line. But if one of the engineers, free of flight operations duties, were scheduled to hold brief talks with pilots at the airfield, such as on aircraft engine operation in certain specific conditions, for example, he could also give an immediate reply to technical questions of interest to them.

Unfortunately our engineer personnel at the present time do not sufficiently participate in teaching flight personnel at the airfield. To be quite honest, one does not very often see engineers or service chiefs conducting training drills. But who other than they can do a better, more complete and clearer job of ushering a pilot into theory, acquainting him with the latest engineering advances, and helping him acquire the technical skills which are so essential in flying a supersonic fighter?

There is unquestionably a good deal of food for thought here for unit staff officers and political workers. For example, it is sufficient for each flight operations day or shift to prepare in advance a list of items the need for resolving which proceeds from the nature of the flight assignments being performed, that is, is dictated by the very content of the schedule. One should bear in mind thereby that at the airfield there is neither time nor need to present basic lectures on theory or reports. It will be entirely sufficient to limit proceedings to an examination merely of individual topic items, which will take literally just a few minutes. The benefit from such additional specific learning activities is obvious.

The unit methods council also plays a very large role in this. It is logical that council members include the most experienced combat pilots. Joined into an innovative team, they give the commanding officer considerable assistance in improving methods of teaching flight personnel, engineers and technicians, and improving operation and maintenance of aircraft and flight safety. Scientifically substantiated recommendations by the methods council, drawn up taking into account the experience of the finest aviation personnel, help intensification of the training and indoctrination process and mastery of new, advanced forms of teaching such as, for example, breaking in pilots by individual schedules, technical discussions, solving problems in aerodynamics, weapon training, tactics, and other items. The task merely consists in applying these forms in practice in a competent, innovative, knowledgeable manner.

Life moves forward, advancing more and more new demands. That which yesterday was considered an achievement today can no longer satisfy us -- Communists and defenders of the homeland's airspace. This is why our commanders and political workers, staff officers, party and Komsomol activists spare no effort in the campaign for intensification of the training process in seeking new, effective forms of teaching and indoctrinating personnel toward the end of further increasing the unit's combat readiness.

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DETERMINING INSTRUMENT APPROACH DECISION HEIGHT AND CLOUD CEILING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) p 28

[Article, published under the heading "Constant Attention to Flight Safety," by Lt Col (Res) N. Ustimenko: "What Is the Height of the Cloud Bases?"]

[Text] In flying it sometimes happens that the weather sharply deteriorates contrary to the forecast, and aircraft are forced to proceed to the alternate field. There may be no flight operations in progress at that field, and specialists estimate meteorological conditions on final approach by instrument. In order to ensure a safe landing for diverted aircraft, it is important to have precise figures on ceiling and visibility on the approach glidepath.

There exist various methods of determining these figures, but unfortunately errors cannot be avoided. In addition, while an aircraft is en route to the designated field, for example, weather in the destination area may deteriorate. Therefore specialists are constantly seeking new methods of improving the accuracy of weather data and perfecting forecasting methods.

Some work in this area is also being done in our subunit. I would like to share some observations on the pages of this journal.

As a rule, ceiling (VNGO) is determined with an "Oblako" [Cloud] instrument, which produces fairly substantial error. In instrument measurement methods the point of reading ceiling height is determined by the cloud layer. Its vertical thickness in each specific instance should correspond in optical properties to the threshold of sensitivity of the measuring method (instrument).

Designating cloud layer thickness (Delta Hcl) as the difference between the height measured by instrument (Hi) and the actual cloud boundary (Hcb), we find Hcb=Hi-Delta Hcl (1), where Delta Hcl is a variable quantity which is dependent on the optical density of the registering cloud (fog) layer. Physically it is expressed in measuring instrument error. It is evident from formula 1 that the ceiling is independent of method of measurement. What is determined is not the actual ceiling but that height in the cloud cover which corresponds to the upper boundary of the registering layer. Experiments have

shown that the difference between subsequent readings is measured relative to the upper, not the lower boundary and does not always characterize a change in the actual height.

In the Oblako instrument vertical thickness of the registering layer is measured with an error of 20 to 100 meters (see table). It is determined in a layer from 50 to 80 meters with an accuracy probability of 83 percent.

Relationship Between Vertical Visibility (Vv) in Fog and Horizontal Visibility (Vh)

1 Вертик. прибор «Облако»	2 Горизонтальная видимость по ориентирам														3 Всего случаев
	100	150	200	300	350	400	450	500	550	600	700	760	800	1000	
20			2	1											3
30			6	5		1		1							13
40			8	20	1	1		6	6			1			43
50	2	5	89	2		14	2	60	21	3		2		1	201
60			10	1		2		27	9	3	1	18	1	1	73
70			4	2	2	1	3	10	6	2	4	11	6	4	55
80			2		1		2	12	3	3	1	8	6	5	43
90										2			5	1	8
100													1	7	8
3 Всего случаев	2	5	121	31	4	19	7	116	45	13	6	40	19	19	447

Key: 1. Oblako vertical instrument; 2. Horizontal visibility according to reference points; 3. Total instances

Note: 447 hourly and more frequent measurements were selected for the period September-December 1982 and 1983 from 51 series with fog (cloud cover ceiling drops to ground surface).

Average instrument error can be determined with a regression line equation constructed from experimental data (see table): Delta Hcl=0.05 Vh+30. (2)

Analysis of regression line equations (2) indicates that the average height of the upper boundary of the registering layer changes abruptly within a range of 30-80 meters (with horizontal visibility changing from 0 to 1,000 meters) due to irregular variation in optical density. The lower cloud boundary is determined from the layer with horizontal visibility range (Vh).

The under-cloud air layer (between the boundary of condensation of water vapor in the atmosphere and cloud bases or ceiling) physically comprises a mist or haze of varying intensity. When Vh=1,000 m or less it transitions to fog at the ground surface and to cloud layer in the atmosphere. Experiment (see table) is confirmed by instrument when the horizontal visibility value approaches 1,000 meters and vertical thickness runs 50-100 meters. In other words, ceiling can be determined by cloud cover level with horizontal visibility of 1,000 meters. Observations indicate that accuracy of determination of ceiling depends only on horizontal visibility at the lower cloud boundary, and it is calculated, taking error into account (2), with the

following formulas:

$$Hcl/Vh=1,000=Hi-(0.05\ Vh+30)=Hi-80 \quad (3)$$

or with an increase in the layer's optical density,

$$Hcl/Vh=500=Hi-(0.05\ Vh+30)=Hi-50. \quad (4)$$

Naturally a pilot is interested not in the height of a physical phenomenon but rather the actual height beginning at which the ground cannot be seen. Of importance to him are two levels in the cloud cover which are identified with height of lower cloud boundary: that which enables him to fly under Visual Flight Rules, and that height from which solid visual contact with ground reference points is possible for executing a landing approach.

Calculations indicate that with an indefinite ceiling a pilot can observe reference points in the runway zone with a cloud level horizontal visibility in which is 500 meters. With sharply-defined cloud bases the ground can be observed from a layer at which Vh=200 m if the levels are situated at Delta Hcl above "decision height" (Hd), that is,

$$Hi=Hd+(0.05\ Vh+30). \quad (5)$$

We shall examine this with an illustration. Let us assume that decision height on final approach is 120 meters. The instrument also indicates 120 meters. We must determine at what height the pilot will be able to establish solid visual contact with the ground and what lower cloud boundary height the Oblako instrument should indicate for ground reference points to be in solid visual contact from the specified height.

Instrument error ranges from 50 to 80 meters (see table). The extent of flight in clouds on final approach (with a 3 degree glideslope) from decision point to breakout will be 960 and 1,530 meters respectively. Thus the pilot will make visual contact with the ground at a height of 70-40 meters, which is unsafe. With successful completion of the flight, the potential for an air mishap is reliably reduced by figures from increased-frequency ceiling measurements in the runway zone.

In order to establish solid visual contact with the ground from a height of 120 meters (when Vh=500 m) it is essential that

$$Hi=Hd+(0.05\ Vh+30)=120+55\sim170 \text{ m, or } 150-160 \text{ m (when } Vh<200 \text{ m)}.$$

The conclusions reached on the basis of the fog experiments also apply to a cloud field, since there is no fundamental difference in microphysical structure and parameters between these physical phenomena.

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ILLUMINATING GROUND TARGETS WITH PARACHUTE FLARES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) p 29

[Article, published under the heading "Be Alert, In a Continuous State of Combat Readiness," by Military Pilot-Expert Marksman Lt Col G. Mazin: "'Chandelier' Over the Range"]

[Text] In conformity with the squadron tactical air exercise missions, the aircrews would be striking ground targets at night. Special crews were assigned to illuminate the targets. I was one of those assigned this mission.

During the pre-mission preparation it was necessary thoroughly to study the range area, the disposition of friendly ground subunits and the "adversary," the capabilities of the flight operations support radar facilities, as well as the disposition of opposing air defense assets. The pilots laid out their routes on charts taking topography into account and computed the most advantageous flight conditions by stages, approach to the target, weapon arming and bomb release points. It was particularly important to compute release altitude. The fact is that the illumination bomb flares were to be fully extinguished before reaching a height of 500 meters. In addition, success in employing illumination aerial bombs and, correspondingly, successful attacks on ground targets by strike aircrews are determined in large measure by the quality of meteorological support. An important role here is played by weather reconnaissance aircraft data on visibility, cloud tops and bases. And of course it is very difficult correctly to compute the illumination bomb release point without precise data on winds aloft direction and velocity above the range. The computation method is described in detail in the appropriate literature, and therefore I shall endeavor to cover only certain features of placing parachute flares based on my own experience.

In air actions in support of ground troops it is very important to bear in mind that flares should go out prior to reaching the dispositions of friendly ground subunits. Otherwise one could play into the "adversary's" hands. In addition, in calculating bomb release altitude one should also consider the fire hazard factor. The release point should be selected so as to ensure a safe fall in case the parachute fails to deploy. In making this computation, one considers time fuze activation time, time required for the parachute to emerge from the bomb case, and time for the canopy to fill with air.

If there is a thick haze or cloud cover over the range, when it is difficult to conduct visual target search, an aircraft initiates attack course from calculated data with the aid of the onboard navigation system and other electronics. Wind information is very important in these conditions, since a strong wind shortens flare burning and target illumination time, and can also carry bombs beyond the boundaries of the range "hot" area or carry them toward friendly troop positions. If bombing is to be conducted in a series, it is essential also to consider time and length of series, which determines when the release button is pressed. It is best to select a ground light marker for "referencing" to the target to the left or right of the path of the run on target.

In preparing for their missions, the parachute flare illumination pilots considered the recommendations of the methods council and experienced pilots, and made preliminary calculations. On the day of the exercise they made corrections to the computations following final mission briefing.

At the designated time the aircrews lifted off into the night sky. En route to the range they monitored track and en-route progress with the navigation system and command post data. In conformity with the mission plan, they executed a missile-evasion maneuver and turned to attack course heading. Precisely-honed coordination between aircrews and tactical control officer made it possible promptly to spot the checkpoint. At this point excessive slowness or inaccuracy in the actions of pilot or command post officer are equally fraught with the possibility of major errors, while the "adversary" will not permit a second run.

...Weapons armed. Thumb on release button. At the designated point I commenced the time count. Time! I pressed the button and verified bomb release. Illumination flashed behind us. The ground lit up with a bright, white light. It became light in the cockpit. I immediately focused my entire attention on the gauges, because a strong glow formed in the haze around the aircraft. In these conditions one must fly on instruments. Over the radio we could hear the fighter-bombers initiating their attack.

This time the pilots successfully accomplished their assigned missions. All targets were carpeted with heavy rocket fire and bomb loads. The thorough preparation on the ground had helped achieve success.

We must state that illumination flare release missions present no particular difficulty for a well-trained combat pilot. The main thing is to have a serious attitude toward preparing documentation and calculations when readying for the mission, to establish precision coordination with supporting subunits, and psychologically to prepare oneself for carrying out these important missions.

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REQUIREMENTS, PROCEDURES FOR APPLYING FOR ADMISSION TO SERVICE SCHOOLS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 30-31

[Article, published under the heading "Readers Request," by Col A. Mel'nikov: "To Those Desiring a Career in Aviation"]

> [Text] Journal readers Yu. Kuprin, V. Frolov, I. Chervonenko and many others have requested that we discuss the rules and procedures of acceptance to enrollment in Air Forces higher educational institutions and tell about the history, traditions, and current affairs of some military aviation schools. The following article contains replies to questions of interest to them.

Pursuant to the demands of the CPSU and Soviet Government on strengthening our country's defense capability, military aviation schools perform an important and honorable task of training highly-skilled aviation specialists.

The initial steps taken on the road to establishing the Air Forces higher educational institutions are inseparable from the name of V. I. Lenin. "We need a regular army with a wealth of equipment...," he stated at a conference in March 1918 dealing with matters of military organizational development. "We must train pilots...."

The problem of training aviation cadres had to be solved in a difficult situation. During the hard years of civil war and foreign military intervention, the newly-established aviation schools and training detachments succeeded, working under the most difficult conditions, in training more than 1,000 pilots and 250 aerial observers. The Moscow, Petrograd, Kiev, and Kacha flight schools gained extensive fame during that time.

In the prewar period a well-formed system of training pilots, navigators, engineers, technicians, and other aviation specialists was established in our country. By the beginning of the Great Patriotic War, two academies and dozens of service schools were training cadres for the Air Forces. Aviation personnel who were fated to the harsh tests of war were trained and indoctrinated at these institutions. They brought fame to the Soviet homeland

with their heroic exploits. Soviet aviators smashed fascist Germany's vaunted military aviation in savage air battles.

Today Air Forces military educational institutions comprise an array of academies, higher flight and engineering schools, and secondary technical schools, which provide a higher and secondary education to aviation personnel of all areas of specialization: pilots, navigators, engineers, tactical control officers, engineer-weather forecasters, and technicians of various occupational specialties.

A leading position among aviation schools is occupied by the Kacha Red-Banner Order of Lenin Higher Military Aviation School for Pilots imeni A. F. Myasnikov -- a famous institution and one of the oldest "forges" for turning out fighter pilots.

The history of this school is linked by inseparable bonds to the history of Soviet military aviation. It began with the Sevastopol Officer Aviation School, established in 1910. Two years later the school was relocated to the Crimea, to a field airstrip by the Kacha, a small stream. This flight school henceforth bore the name "Kacha." More than 600 pilots were trained here prior to the revolution.

During the period of civil war and the struggle against foreign interventionists, graduates of the Kacha School formed the backbone of the Red Air Force. They fought selflessly against the White Guardists and interventionists. They included outstanding Russian pilots M. Yefimov, D. Andriadi, K. Artseulov, and many others. For its success in the area of training pilots, in 1925 the Kacha Aviation School was conferred the name of party and government figure A. F. Myasnikov.

Thousands of young Communists and Komsomol members received their passport to the skies at Kacha in the prewar years. They fought bravely at Lake Khasan, above the Khalkhin-Gol River, and on the side of Republican Spain. Kacha Aviation School graduates G. Kravchenko and Ya. Smushkevich were among the first in our country to be twice awarded the lofty title Hero of the Soviet Union. The Kacha Aviation School was awarded an Honorary Revolutionary Red Banner of the USSR Central Executive Committee in 1933 for successful training of flying personnel.

During the years of the Great Patriotic War, in spite of great difficulties, the school successfully accomplished the training of aviation cadres for the fighting forces. Graduates of Kacha displayed in battles for the homeland exemplary models of combat skill, bravery, courage, and an indomitable will for victory over a hated foe. Former students include 291 Heroes of the Soviet Union, 14 graduates were twice named Hero of the Soviet Union, while Mar Avn A. Pokryshkin was thrice awarded this title. During the war Kacha graduates downed approximately 3,000 enemy aircraft and performed 49 aerial rammings.

Since 1954 the Kacha Higher Military Pilots' School has been located in a major Soviet industrial and cultural center -- the hero-city of Volgograd, which possesses rich revolutionary, combat and labor traditions. Future

pilots are sworn in on Mamay Hill. Four years later, upon completing their training, new graduates are formally commissioned as officers on the same site.

In 1959 the Kacha Higher Military Pilots' School was upgraded into a higher school, and the first class of pilot-engineers was graduated in 1963. Since that time the school has exclusively turned out officers with a higher education. In 1965 the school was awarded the nation's highest honor -- the Order of Lenin -- for its distinguished service in training highly-skilled flying personnel during the Great Patriotic War and in the postwar years.

Many graduates of the Kacha School have become prominent military commanders, while Chief Mars Avn P. Zhigarev and K. Vershinin at one time commanded the Air Forces. School graduates V. Bykovskiy and V. Shatalov were among the first to become pilot-cosmonauts USSR. They contributed glorious pages to the chronicle of the conquest of space.

Thus we have in a nutshell the history and combat traditions of one of the oldest of our famed Air Forces flight schools. There are also many interesting and noteworthy things in the doings and affairs of other Air Forces educational institutions.

What are the rules and procedures for acceptance to enrollment in these schools? Who can become a military pilot, navigator, engineer, or technician?

Military aviation schools accept to enrollment warrant officers in active military service in the USSR Armed Forces, compulsory-service and extended-service personnel, military construction personnel, civilian youths, military reservists who have completed their term of active military service, and graduates of Suvorov and Nakhimov military schools, who have a completed secondary education, who possess a high degree of sociopolitical activeness, moral and ethical qualities, the requisite professional-aptitude and psychological characteristics, who have chosen for themselves with full deliberation and awareness the profession of military pilot, navigator, engineer or technician, who are suitable by virtue of state of health and physical fitness for enrollment at Air Forces higher educational institutions and who have successfully passed entrance examinations.

Air Forces aviation schools accept warrant officers after two years of service in warrant officer or officer positions, extended-service personnel after two years of extended service, and military reservists who have completed active military service, not more than 23 years of age; compulsory-service personnel and military construction personnel, regardless of their military occupational specialty or length of service; civilian youths, graduates of Suvorov and Nakhimov military schools, from 17 to 21 years of age.

Compulsory-service and extended-service personnel as well as warrant officers wishing to enroll at a military educational institution shall submit an application through channels to the military unit commanding officer no later than 1 May of the year of intended enrollment. The application shall state military rank, last name, first name, patronymic, current job position, year and month of birth, level of education, and name of military educational

institution. Applicants shall append to the application personal biographical data, service report, party (Komsomol) reference, service record, properly notarized copies of the certificate of secondary education (persons currently enrolled in secondary schools, secondary technical schools, and vocational schools shall submit a certificate of current progress), birth certificate, and three certified photos (bareheaded, measuring 4.5 x 6 cm).

Applicants shall submit their identity cards [internal passport], military service card or residence registration card, the originals of the certificate of secondary education and birth certificate to the board of admissions on arrival at the military educational institution.

Candidates for admission shall arrive at the school at the times specified for taking entrance examinations, when notified by military commissariats and unit commanding officers, which/who shall issue them documents authorizing free travel. Secondary-school graduates shall be provided free dormitory space and board upon arrival at the school.

Competitive entrance examinations for enrollment at Air Forces higher flight and engineering schools shall cover the secondary-school curriculum in mathematics (oral), physics (oral), Russian language and literature (written), and history of the USSR.

Entrance examinations for enrollment at aviation secondary schools cover mathematics (oral), Russian language and literature (written). Civilian youth candidates for enrollment shall be tested for physical fitness according to the requirements of individual performance standards of the USSR Prepared For Labor and Defense program.

Admissions boards shall conduct occupational-aptitude selection and entrance examination activities from 10 through 30 July.

The following shall be accepted to enrollment at Air Forces schools without testing their knowledge in the general scientific subjects, under the condition that they meet the other requirements of aptitude selection: Heroes of the Soviet Union and Heroes of Socialist Labor; compulsory-service and extended-service personnel, warrant officers, and military reservists who have been awarded government decorations for gallantry in combat actions in defense of the USSR and performance of their internationalist duty; graduates of Suvorov and Nakhimov military schools; persons who graduated from secondary school with a gold medal or graduated from a secondary educational institution with honors and who have undergone group 1 career-aptitude psychological selection -- to higher military aviation schools for pilots and navigators; persons who have graduated from secondary school with a gold medal or from a secondary specialized school with honors -- to military aviation engineering schools.

Persons who were awarded a gold medal upon completing secondary school or who graduated from a secondary specialized school with honors, when applying for admission to higher military aviation schools (except for applicants seeking admission to flight and navigator schools with group 1 psychophysiological aptitude rating) shall take only one examination, to be determined by the

commanding officer of the military educational institution, in the specialization subject. If they receive a mark of excellent on the examination in this subject they shall be exempted from further examinations, while if they receive a mark of good or satisfactory they shall in addition take examinations in the other subjects included in the entrance examinations.

Persons who have completed the first or subsequent years of study at civilian higher educational institutions, majoring in fields corresponding to the field of specialization of the military higher educational institution in question, and who meet the other aptitude selection requirements for enrollment, may be accepted to enrollment in the first year of study at Air Forces higher and secondary military schools without being tested in the general scientific subjects, following a suitable interview. If areas of specialization fail to match, applicants shall take all prescribed examinations.

The following are admitted to Air Forces higher educational institutions without competitive examination, on the basis of aptitude selection results, assuming favorable marks in the general-curriculum subjects: military personnel who have displayed excellent moral and fighting qualities in defending the USSR and in performance of their internationalist duty; compulsory-service and extended-service personnel who are excellent-rated in combat and political training and who have received a commendation at the unit level; extended-service personnel -- to military aviation engineering schools.

Competitive selection of applicants shall be carried out on the basis of consideration of their sociopolitical activeness, moral and ethical qualities, psychological characteristics, state of health, level of physical fitness and general educational preparedness. Competitive selection of civilian youth applicants shall be performed separately from military applicants.

The following shall be given preference in competitive entrance examinations: warrant officers with considerable military service experience and extensive length of service in their occupational specialty and the specialization area of the military educational institution, as well as military personnel who are proficiency-rated specialists; applicants sent to study on all-union travel authorizations; applicants with higher psychological aptitude selection scores; applicants who are workers and kolkhoz farmers with a length of employment of at least one year.

The term of study at higher pilot and military political schools is 4 years; at higher engineering schools -- 5 years; at secondary aviation-technical schools -- 3 years.

During their term of study, officer cadets are given each year 2 weeks of vacation and 1 month of leave with free travel. Officer cadets enrolled in service schools are considered to be in active military service and are provided with all pay, food, and clothing to which military personnel are entitled.

Persons graduating from service school are commissioned with the rank of lieutenant, are presented with a standard diploma, are assigned an appropriate military occupation specialty classification and badge.

Addresses of schools can be obtained at military commissariats at one's locality of residence.

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WIND EFFECT ON RANGE GUNNERY, DIVE RECOVERY

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 32-33

[Article, published under the heading "Constant Attention to Flight Safety," by Military Pilot 1st Class Capt A. Ziziko: "Taking the Wind Into Account"]

[Text] They were flying training sorties to the range. The pilots accomplished the assigned task. But upon analyzing the flight recorder tapes, the specialists drew attention to the fact that at the moment of rocket (NRS) release and cannon fire the dive angle was excessive, and pullout was at absolutely minimum safe altitude. Analyzing these errors, they determined that the pilots had reached the initial aiming point (TNP) with the prescribed parameters and with the specified engine operating conditions, and had figured in an aiming correction (for projectile carry) to compensate for a strong tailwind. But what had caused the increase in dive angle during the attack?

As a rule fighters determine the moment to open fire on ground targets in manual sight mode. This method is effective when the dimensions of the target are not known in advance and it is not possible to determine range to the target. It consists essentially in the fact that at a prescribed dive angle the permitted range of fire is tied into altitude, that is, firing commencement and dive recovery height is prescribed.

In order to understand how the wind affected the pilots' activities that day, we shall examine the motion of a diving aircraft taking into account a tailwind (headwind). We shall take as our reference system not air masses (as is customarily done in performing calculations prior to flying in the practice area) but rather the ground surface. The fact is that during aiming the pilot would "reference into" a stationary target situated on the ground surface and would fail to consider the aircraft's motion together with the moving air mass.

It is evident from Figure 1 (on the back cover) [not reproduced] that with a wind velocity U other than 0 an aircraft moves along a path which differs from a no-wind path. The coordinates of point B1 on the OoXo; OoYo axes will differ from the coordinates of point B by

Delta Xo=Ut-div and Delta Yo=Vyav t-div respectively.

The current dive angle (lambda-cur), with a tailwind (headwind), is measured in the direction of increase (decrease).

With the aid of Figure 2 (on the back cover) [not reproduced], we can determine the following:

$$\text{tg lambda-sp} = \text{Hbp}/\text{L1} + \text{or-Uh t-div},$$

where lambda-bp -- actual dive angle at which dive pullout begins when there is wind present; Hbp -- altitude at which dive pullout begins; L1 -- distance to target on the OoXo axis at the moment of commencement of dive recovery when lambda-bp=lambda-pre or Uh=0.

In no-wind conditions lambda-div=lambda-b=lambda pre. With wind the angle will change (figures 3 and 4 on the back cover) [not reproduced], but it is difficult for the pilot to monitor it on the instruments due to insufficient time available. As was already stated, in manual mode, at a prescribed dive angle, firing (launch) as well as dive recovery commence at a specified altitude Hpre=Hcf, Hpre=Hbp. Altitude loss during dive pullout is determined with the following formula:

$$\text{Delta H} = \text{Vsquared-av}(1 - \text{cos-lambda})/\text{g}(\text{ny-av} - \text{cos x lambda}/2).$$

During establishment of a prescribed normal load factor for a pilot (ny=4 in the third second) during dive recovery, altitude loss will be greater with a tailwind due to large lambda-cur=lambda-bp>lambda bd, while dive recovery will end at a lower altitude than in no-wind conditions. While in no-wind conditions Hep=428 m when firing rockets and cannon (during recovery) with lambda-div=20 degrees, Hep=233 m (cannon lambda-div=20 degrees) and Hep=284 m (cannon lambda-div=30 degrees), Hbp will be 620, 450 and 730 m respectively, with a tailwind U>17 m/s, U>13 m/s, U>19 m/s respectively, recovery altitude will be less, Hsaf=400 m (rockets + GSh [cannon], Hsaf=200 meters (GSh) (Figure 4 on the back cover) [not reproduced].

The pilot must increase the load factor during dive recovery in order to observe flight safety conditions and to pull the aircraft out of a dive at the prescribed altitude with high tailwind velocities.

Figure 5 shows the relationship between change in average normal load factor required for safe fighter dive recovery with a change in wind velocity. We should note that maximum load factor on pullout is always greater than average and, consequently, the difference in generation of required maximum load factors on pullout with an increase in tailwind velocity will be greater. It runs 2-3 units, and the pilot must take this into account.

With an increase in headwind, with the same conditions, flight safety is observed, but ordnance release range increases (Figure 6), which worsens firing results.

As we see, a strong wind can affect weapons delivery and flight safety in determining the moment to commence fire and the altitude at which to begin

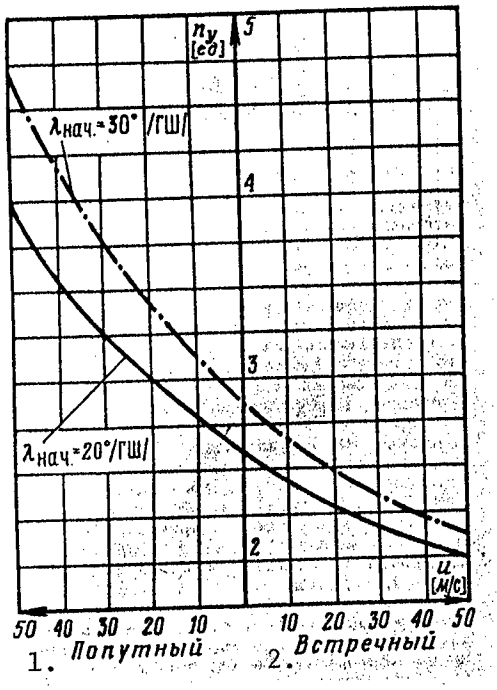

Figure 5. Relationship between average normal load factor required for safe dive pullout with wind of various force.

Key: 1. Tailwind; 2. Headwind

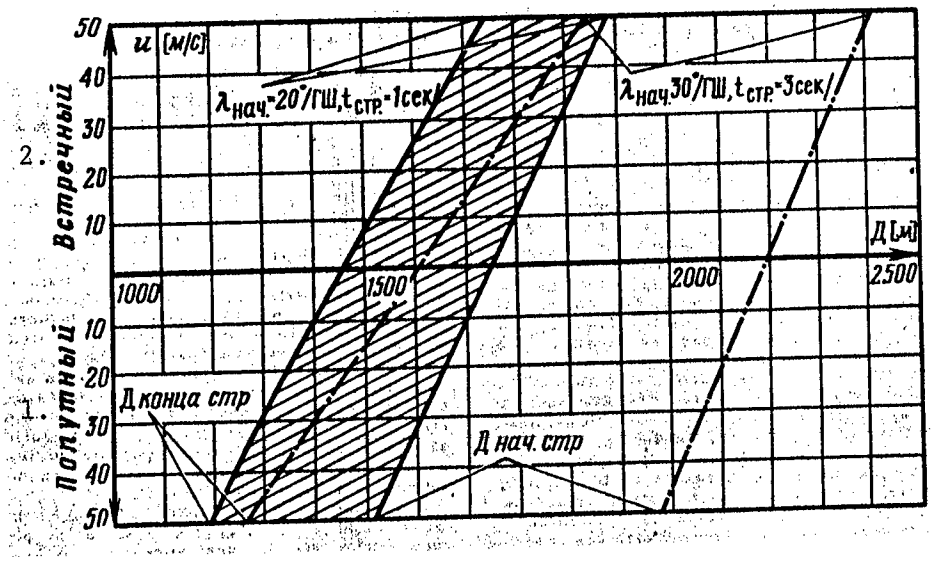

Figure 6. Relationship between zone of fire (range to target) and wind.

Key: 1. Tailwind; 2. Headwind

dive recovery. The range air controller and aircrews must be continuously current on wind velocity and direction in the range area. This is especially important in mountain-desert terrain, where wind velocity can reach high values (up to 60-70 m/s), while it may be within allowable limits at ground level in the airfield area.

When employing the method of weapons delivery at a prescribed altitude for commencing fire and beginning dive pullout in relation to wind velocity, Hbp U=0 will differ from Hbp preU not equal 0 by:

Delta H=2U[m] when U<30 m/s
Delta H=3U[m] when U>30 m/s
} lambda-b=20 degrees

Delta H=4U[m] when U<30 m/s
Delta H=5U[m] when U>30 m/s
} lambda-b=30 degrees

If there is no information on winds, especially tailwinds, over the range (ground and naval surface target location), the pilot himself should estimate wind velocity and direction. The aiming mark is constantly "slipping" from the target in the direction of flight, and the pilot must move the controls forward. In this instance it is advisable to pay greater attention to the instrument readings. It is better to commence fire at an altitude H=25 m greater than the prescribed altitude for each degree of increase in dive angle and to pull the aircraft out of the dive more vigorously.

I believe many pilots have noted the peculiarities of work on the range with strong winds. The above calculations will help them hit ground targets more accurately and effectively.

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EMERGENCY PROCEDURES FOR HELICOPTER ENGINE FAILURE ON TAKEOFF

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 34-35

[Article, published under the heading "Constant Attention to Flight Safety," by Maj N. Kompaniyets: "It was Necessary to Abort Takeoff...."]

[Text] The helicopter crew was taking off in a two-ship element from a site of restricted size. The pilot concentrated his attention on the lead helicopter in order to hold position in formation, neglecting to monitor rotor rpm. The craft picked up speed after gaining little altitude. To the ear the engines were operating normally in takeoff mode. Nothing seemed to presage danger.

Suddenly the crew felt the helicopter "sink," unusual on takeoff. The voice annunciator immediately warned: "On-line tank pump failure, check fuel remaining." The aircraft commander looked at the instrument panel. The rotor rpm gauge needle was at 85 percent and dropping fast. The airspeed indicator and altimeter were reading 75 km/h and 30 meters respectively. The craft was dropping toward the treetops.

The situation was critical. The pilot pulled back vigorously on the cyclic stick and advanced collective, putting the craft in a landing configuration. Losing airspeed, the aircraft made it past the trees, but set down hard on the landing site. The tail rotor and boom were damaged.

Analysis of the flight recorder tapes and a ground test of the engines indicated that the incident had been caused by engine surging during takeoff, due to an oversight by maintenance personnel. During the critique of the aircraft commander's actions in response to this situation, the pilots expressed various opinions. One of them stated the opinion that at the given airspeed and altitude, the aircraft could have been put into level flight with prompt action on the controls. The entire situation had to be thoroughly analyzed.

For this purpose we analyzed a generalized performance curve of a helicopter with one operating engine, in takeoff configuration (Figure 1) and the relationships between required and available power and main rotor collective pitch angle on the one hand and airspeed on the other (Figure 2). The

generalized performance curve gives an idea of the flight capabilities of a helicopter with one engine operating and combines maximum takeoff weight (Figure 1a) curve, altitude-airspeed (Figure 1b) and altitude-climate (Figure 1c) engine performance curve. It graphically depicts changes in altitude-airspeed performance characteristics and, consequently, helicopter flight performance capabilities in relation to takeoff conditions. It is put to practical use for selecting recommendations to the pilot on flying technique in various conditions.

For example, if we know takeoff conditions: Gf=11,200 kg and t-r=+25 degrees Celsius, as well as airspeed and altitude at the moment of engine failure, we can find the position of the helicopter in Figure 1b (point A). It is clearly apparent here that in such conditions the helicopter was unable to continue level flight, since it was outside the envelope of altitudes and airspeeds for the above conditions. Consequently, at point A, regardless of the pilot's actions, the helicopter must descend with an increasing sink rate, the end value of which is determined by insufficiency of power to turn the main rotor with fixed collective pitch.

As we know, quantity Vy is determined with the following formula:

$$Vy=75 \times -DeltaN/Gf,$$

where DeltaN -- insufficiency of power applied to main rotor; Gf -- helicopter flying weight.

At the same time the altitude-airspeed curve (Figure 1b) for Gf=10,500 kg, and t-r=+15 degrees Celsius indicates that level flight can be continued on one engine.

In Figure 2 it is evident that up to the moment of engine shutdown collective pitch was 11 degrees, while the prescribed rotor rpm was maintained with the available power from two engines. Following engine failure available power at this pitch was cut in half. The main rotor began to decelerate rapidly, while according to calculation the rate of descent could reach a figure in excess of 11 m/s. The flight recorder tape indicated (Figure 3) that in the first two seconds rotor rpm dropped from 95 to 85 percent. Obviously a pitch increase in this situation will lead to greater loss of rotor rpm and increased rate of descent. In sustained level flight, however, as is noted in Figure 2, with a required collective pitch of 7 degrees the deficiency of power for turning the rotor is considerably less (350 horsepower), and rate of descent is also correspondingly less -- 2.3 m/s (Figure 1b).

Thus when an engine fails on takeoff, there occurs an abrupt drop in rotor rpm and the aircraft has a considerably greater tendency to sink than from sustained level flight. It is for good reason that the manual recommends, when engine shutdown occurs at heights of more than 25 meters and airspeeds of greater than 70 km/h, that the pilot reduce collective pitch, keeping rotor rpm from dropping below 88 percent. Figure 2 shows a desirable drop in collective pitch from 11 to 7 percent, which is essential in order to determine the possibility of continuing flight without descent. It is important thereby to maintain a translational speed of more than 70 km/h to a

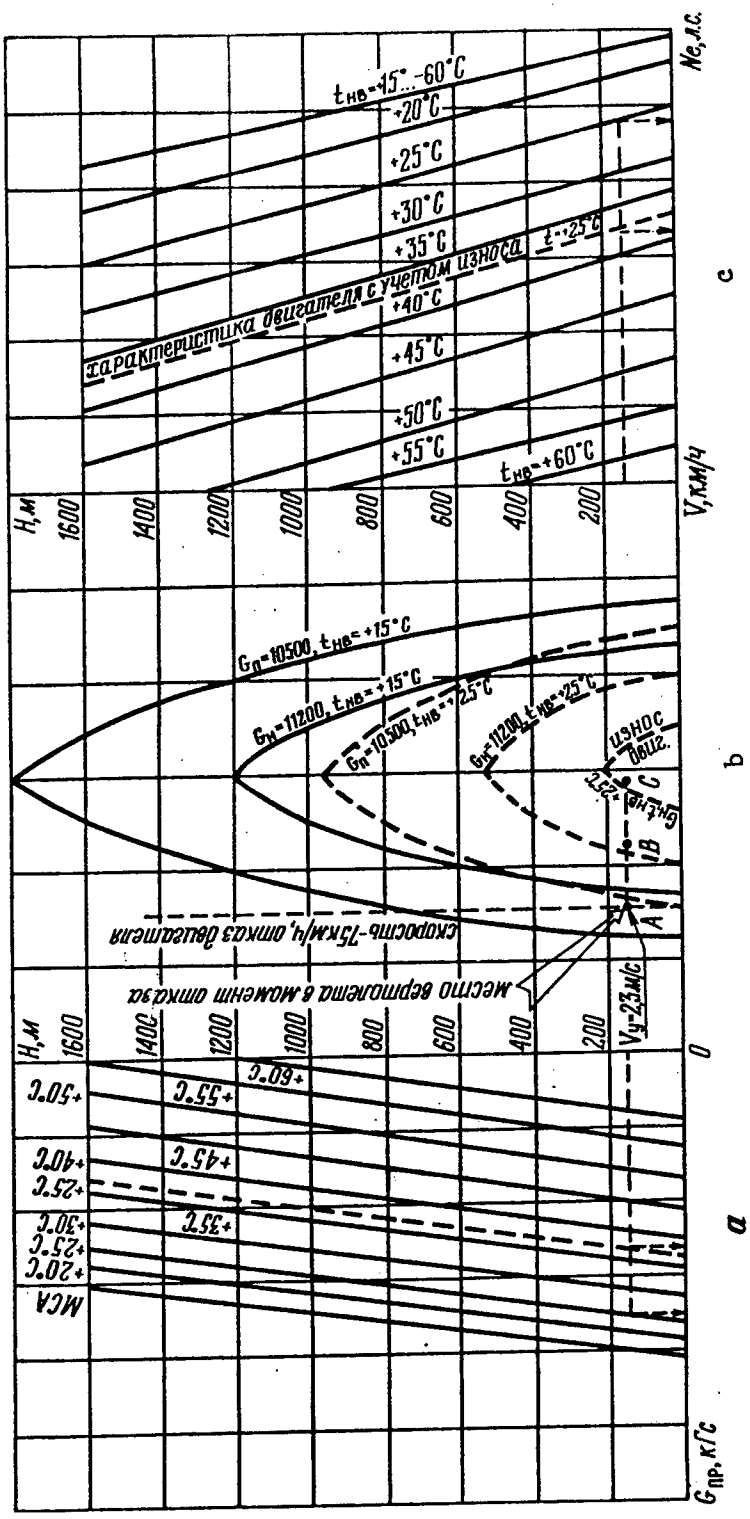

Figure 1. Generalized helicopter performance curves with single-engine operation: a -- helicopter maximum takeoff weight performance; b -- helicopter altitude-airspeed performance curves; c -- engine altitude-climate performance curves.

Key: 1. Position of helicopter at moment of failure; 2. Airspeed 75 km/h, engine failure; 3. Engine performance curve taking wear into account

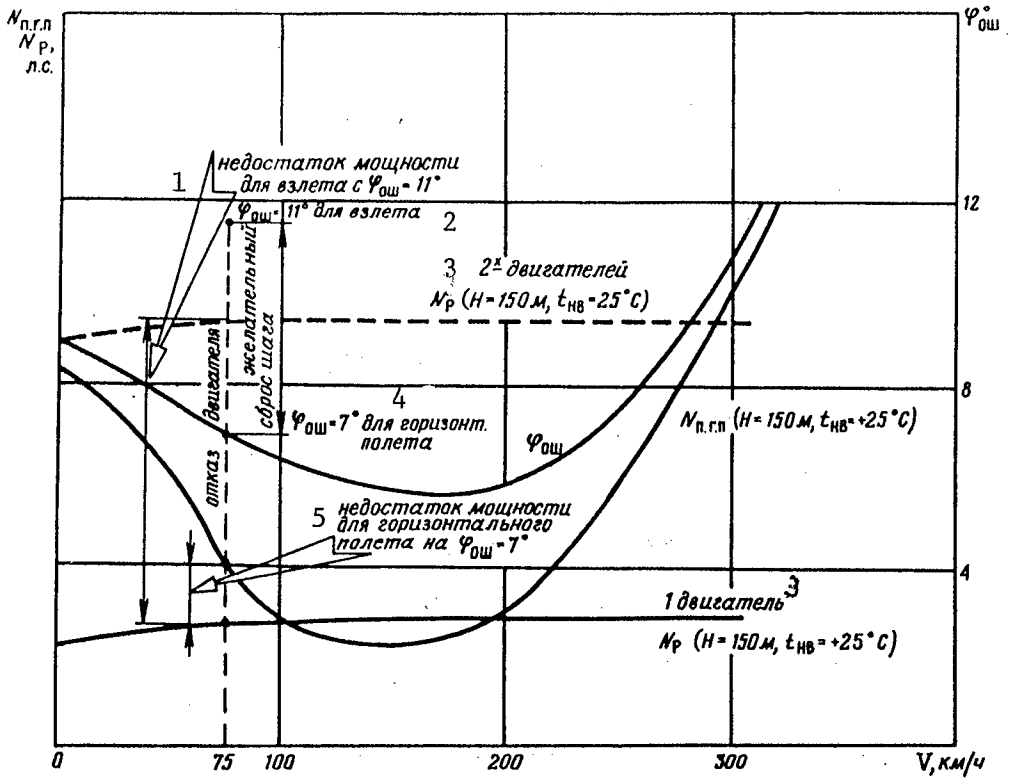

Figure 2. Relationship between required and available power and rotor collective pitch angle, and airspeed.

Key: 1. Insufficient power for takeoff; 2. For takeoff; 3. Engine(s); 4. For level flight; 5. Insufficient power for level flight

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height of 15-20 meters. During further descent below this height the pilot should have used the cyclic stick to establish a landing angle in order to drop off speed without increasing collective pitch. Then rotor rpm would have been maintained. At a height of 3-4 meters the pilot should have increased collective pitch to maximum, that is, given a "burst" to slow the rate of descent. But since a "burst" is accompanied by an increase in nose-up angle, just prior to touchdown he should have pushed the cyclic stick forward in order to avoid touching the ground with his tail boom.

In the case under discussion the engine shut down over forest during takeoff, when the aircraft commander was watching the lead helicopter, and quite naturally in a space of 2 seconds he failed to note that rotor rpm had dropped

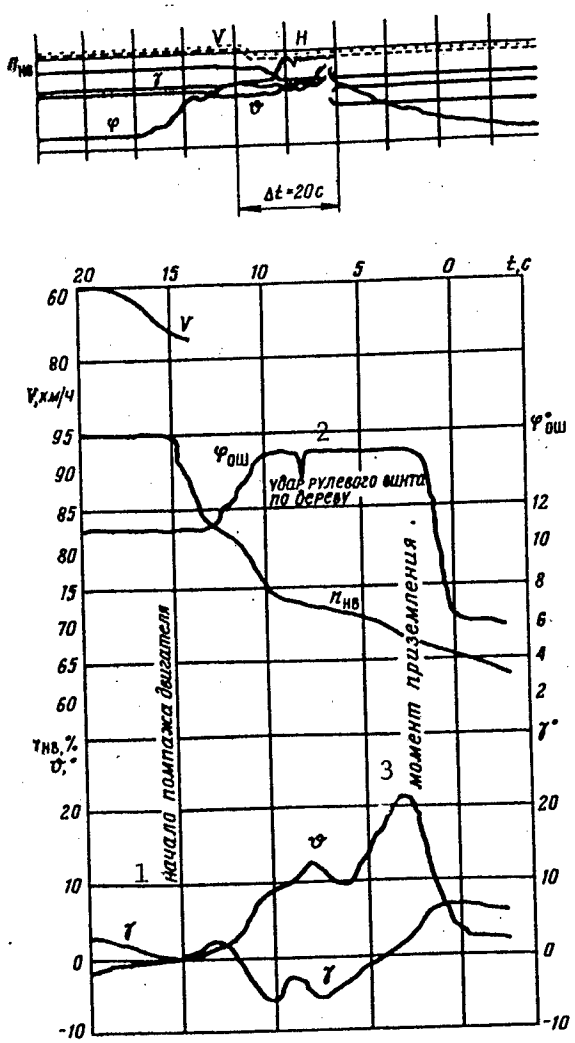

Figure 3. Change in parameters following engine failure.

Key: 1. Commencement of engine surging; 2. Tail rotor strikes tree; 3. Moment of touchdown

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to 85 percent (Figure 3). Precisely for this reason the pilot immediately pulled back on the cyclic stick and brought the collective-pitch stick up.

Thus in order for the helicopter to maintain level flight following the failure of one engine, it was necessary promptly to counter the brisk drop in rotor rpm by "dumping" collective pitch, and the greater the airspeed, the greater the extent to which collective pitch would have to be reduced (Figure 2).

Following engine failure on takeoff a helicopter comes out of trim (Figure 3). The nature of the unbalancing can be qualitatively estimated from the change in the balancing curves for takeoff and flight on one engine in the speed range in question. In general it is accompanied by a turn to the right, a decrease in pitch angle, and rapid rotor deceleration. The turn to the right is caused by the fact that reaction moment from the rotor decreases, while tail rotor thrust relative to the main rotor shaft generates yawing moment. The occurrence of a slip to the left thereby leads to deflection of the main rotor and consequently to tailward and rightward shifting of its resultant thrust. The lateral component of this thrust causes a heel to the right. For all single-rotor helicopters this tendency toward a heel to the right is of a hazardous nature at speeds close to maximum.

During takeoff, due to the low speeds involved, this heeling is virtually unfelt by the pilot. Analysis of the trim curves of some helicopters indicates that at such speeds a turn to the right may be accompanied by a heeling motion to the left due to the main rotor moment of thrust relative to the fore-and-aft axis. Prompt deflection of the left pedal to counter slip diminishes the magnitude of rotor thrust, and the heel to the left is corrected.

The pitch angle decreases primarily due to diving moments produced by the horizontal stabilizer and main rotor during an increase in rate of descent and "dumping" of collective pitch in order to maintain rotor rpm. At the initial moment the pitch angle may increase somewhat due to rotor gyroscopic moment during heeling to the right (Figure 3). Intensity of rotor deceleration following engine failure is determined by the magnitude of deficiency of power to turn it. On the whole the unbalancing is determined by engine performance, airspeed, helicopter weight and balance, and its trim characteristics. Therefore in certain instances of engine failure during takeoff it occurs unnoticed by the pilot.

Thus in order to be prepared to take correct action, it is essential to study in detail the weight and balance curves in the operating manual. It follows from the general mechanisms of unbalancing that in case of engine failure one must promptly counter slip to the left, heel, and pitch down.

We should note that the character of helicopter motion is determined to a certain degree by rotor rpm. An rpm drop to below 85 percent worsens stability and diminishes control effectiveness and sensitivity. The autopilot disengages thereby, and the general situation and helicopter control become considerably more difficult.

Failure of an engine during takeoff requires maintaining energy altitude He:

$$He=H+Vsq/2g+Omega\ sq-r/2G,$$

where H is flight altitude; Vsq/2g -- helicopter kinetic energy; Omega sq-r/2G -- main rotor kinetic energy of rotation.

Energy altitude is the sum of the helicopter's potential and kinetic energy and the kinetic energy of rotation of the rotor blade. A decrease in airspeed and altitude should always be backed up by maintaining the required kinetic energy of rotation of the main rotor. A slight decrease in rotor rpm is permissible only with the requisite altitude or airspeed. As we know, with pitch unchanged, a rapid decrease in airspeed with an increase in rotor angle of attack, as well as a descent on autorotation increases rpm. It is important skillfully to utilize this remarkable aerodynamic property of the main rotor blades in order to increase rotor rpm. For example, with an engine failure during takeoff at speeds in excess of 70 km/h, if it is not possible to continue level flight, with a rapid decrease in airspeed one can maintain rotor rpm and reduce rate of descent. In the hazardous situation under discussion, conditions were created which diminished the helicopter's energy capabilities (He), as a result leading to a hard landing.

It is appropriate to note here that engine wear in the process of operation, and particularly wear on compressor blades, adversely affected altitude-airspeed characteristics (Figure 1b). The dashed line in Figure 1c indicates engine performance for t-r=+25 degrees C taking engine wear into account, with the performance curve showing a loss of effective horsepower DeltaN~280 hp. There is a corresponding worsening of aircraft maximum takeoff weight characteristics, as well as a narrowing of the altitude and airspeed envelope. If we assume for the case at hand engine failure at an airspeed in excess of 110 km/h (point B), one can maintain that the helicopter could have continued level flight with normal engine performance at t-r=+25 degrees C (Figure 1c, solid line). For an engine with lost power this airspeed reaches values in excess of 140 km/h (point C).

It follows from the above discussion that the possibility of putting a helicopter into level flight depends on altitude and airspeed at the moment of engine shutdown, on the aircraft's takeoff weight, degree of engine wear and takeoff conditions, as well as on prompt and correct actions by the pilot. But failure to monitor (even for a brief time) main rotor rpm prevents the pilot from promptly taking measures to prevent rpm drop by decreasing collective pitch.

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HANDBOOK ON MILITARISM, DISARMAMENT REVIEWED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) p 37

[Review, published under the heading "Assisting the Propagandist," by Col (Ret) N. Kon'kov of book "Militarizm i razoruzheniye" [Militarism and Disarmament] by V. P. Abarenkov et al, a handbook, Politizdat, Moscow, 1984, 350 pages, price 45 kopecks]

[Text] Through the fault of reactionary, aggressive NATO forces, and the United States in particular, which is seeking to gain military superiority, the arms race is presently assuming a truly unprecedented scale. A total of 50,000 nuclear weapons have been amassed worldwide to date. There are presently approximately 3.5 tons of TNT equivalent for every person on earth.

The present U.S. Administration, which has proclaimed a "crusade" against communism, has adopted a course of policy aimed at struggle against the socialist world. The Pentagon is devising truly global plans of arms race, with the aim of gaining strategic superiority over the socialist world. Pursuant to the "Directives in the Area of Defense for Fiscal Years 1984-1988," for example, ratified by the U.S. President (the basic provisions of this document have been affirmed and augmented by new directives for fiscal years 1985-1989), almost 2 trillion dollars are to be spent on rearming the United States. It is difficult even to grasp the magnitude of these immense expenditures. Appropriations just covering the period 1985-1989 equal the total amount spent by the United States in the 35 years following World War II.

Appropriations specify development and building of the new B-1B bomber, based on the design of the B-1, which was postponed by President Carter. Cruise missiles are simultaneously being deployed, 3,200 of which will be carried by B-52 and B-1B strategic bombers. The decision has been made to commence regular deployment of the B-1B in 1986. Approximately 100 of these aircraft are to be built.

The Pentagon currently maintains more than 1,500 military bases and installations in 32 countries. Agreements have been reached with Oman, Somalia, and Kenya on utilization of domestic military bases in these

countries by U.S. forces, as well as modernization of these bases and construction of new facilities.

More than 100 naval and air bases located on foreign soil enable the Pentagon to deploy and service large fleet and naval aviation forces virtually in all regions directly adjacent to the countries of the socialist community. In the Far East alone the United States maintains more than 300 military installations near the borders of the USSR.

Other imperialist nations are also active in the struggle against the forces of peace and social advance. Great Britain and France, for example, which possess nuclear weapons, are building up their military potential at an intensive pace. Already today France considers itself the third nuclear power (after the United States and the USSR). French ground-based ballistic missiles (18) have an effective range of up to 3,700 km, while the ballistic missiles carried on five nuclear submarines (80 missiles) have a range of up to 3,200 km. Mirage-IV aircraft (there are 44 of these) have a combat radius of 1,600 km. France also possesses tactical nuclear weapons and means of delivering them to the target. This country's nuclear power should triple by 1990.

Although in 1966 France withdrew from the NATO military organization and is constantly declaring the "independent status " of its nuclear forces, recently French official circles have been declaring France's unconditional adherence to the North Atlantic Alliance and its willingness to carry out its obligations of alliance proceeding from this.

Such factual material is contained in a reference handbook entitled "Militarism and Disarmament," which contains information on the arms race engendered by militarism and reveals the degree of threat hanging over mankind.

The authors have devoted considerable attention to the struggle by the USSR and its allies against militarism and to hold the arms race in check in all the main areas of military danger. This reference manual also contains documentary materials -- declarations, treaties, agreements on limiting the arms race and on disarmament, as well as data on international public organizations which deal with these issues.

This handbook is intended for a broad readership. It will prove useful to agitators and propagandists of Air Forces units and subunits.

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ENSURING AIRCRAFT ENGINE RELIABILITY, LONG SERVICE LIFE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 38-39

[Article, published under the heading "Innovations in Aircraft Maintenance," by USSR State Prize recipient Candidate of Technical Sciences Col V. Fedoseyev and Candidate of Technical Sciences Col A. Orlov: "Reserve Potential for Increasing Engine Reliability and Engine Life"]

[Text] The basic performance characteristics of modern aircraft are determined to a decisive degree by the engines which power them. Speed and range, payload, fuel economy, and maneuverability in performance of combat training missions -- these and many other performance figures are determined by engine qualitative indices. Specialists devote close attention to the matter of ensuring a high degree of powerplant reliability and economy.

Over the period of a number of years we have had occasion to analyze data connected with the operation of gas turbine engines (GTD), which are widely used in modern aviation. We believe that our observations and conclusions will be of some interest to flying personnel, engineers and technicians.

During flight airplane and helicopter engine systems and components are subjected to aerodynamic, centrifugal, vibration and thermal loads, which leads to corresponding mechanical stresses in powerplant components and assemblies. These stresses, of various magnitude, depend to a certain degree on engine operating conditions and flight conditions as a whole. Therefore specialists engineer parts for strength in the course of designing an engine in conformity with load conditions and taking into account a certain model of engine operation on an aircraft of a specific type. Calculations for static strength and resistance to fatigue from the effect of variable loads are basic computations in the manufacture of gas turbine engine components. An important role in this is played by prediction of short-term and long-term static strength. The obtained figures are essential for determining the service life of components in stress-bearing sections or their geometric dimensions, proceeding from projected engine life.

Three basic factors determine the static strength of gas turbine engine components: level of static loads sigma-st, temperature of the component Tc, and load duration tau. Maximum capabilities of a material are figured on the

basis of experimentally determined strength characteristics. Figure 1 contains an example of calculation of safety margin Kt and durability factor Ktau of an engine part from the strength characteristics of the material in question and applied stresses.

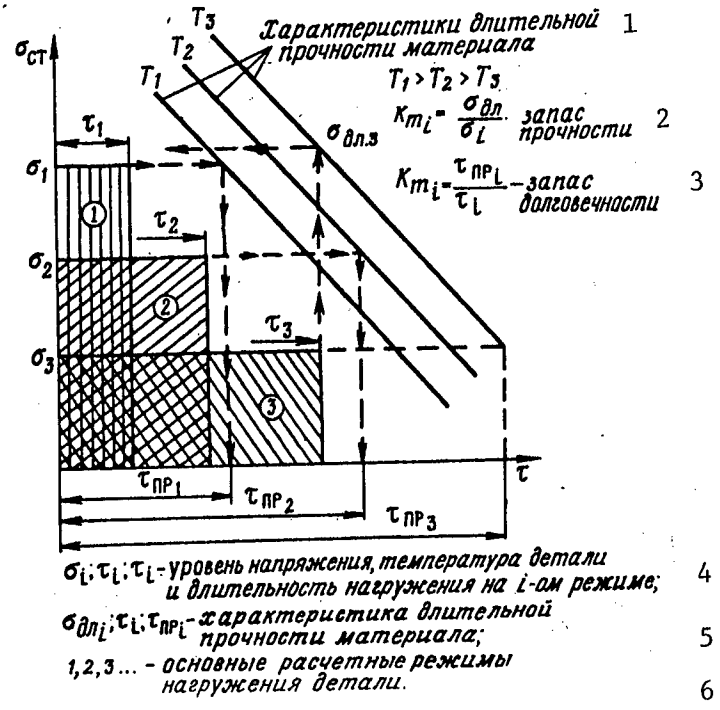

Figure 1. Determination of safety margin and durability factor of an engine component from parameters of conditions of load application and the long-time strength characteristics of a material.

Key: 1. Long-time strength characteristics of a material; 2. Safety margin; 3. Durability factor; 4. Level of stress, temperature of component, and duration of load application in i conditions; 5. Characteristic of material's long-time strength; 6. Principal calculated conditions of component load application

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In order to guarantee the reliability of engine components, designers engineer in an approximately 50 percent stress loading safety margin, which increases parts durability many times over. One must bear in mind that in practice specialists verify adequacy of static strength on the basis of the total number of hours of engine operation, as well as hours of engine operation in "heavy" conditions from zero engine hours (time between overhauls) or a period of time specified on the basis of engine condition.

Aviation engineer service specialists should carefully take into account engine operating hours, especially on aircraft which are not equipped with the

appropriate meters, because understatement, for example, of hours of operation in "heavy" conditions can lead to defects in engine parts and assemblies, while overstatement can lead to premature overhaul. We should note that the fatigue strength of gas turbine engine components under the effect of variable (cyclic) loads is estimated by calculation-experimental methods. High-cycle and low-cycle fatigue are differentiated.

High-cycle fatigue is fatigue in the material of engine components caused by vibration stresses occurring in conditions of oscillations, principally resonant oscillations, under the effect of variable loads caused by pulsing of flow in an engine's gas ducting and by out-of-balance rotors. The frequency of load application on, for example, blades, disks, shafts, housings, and lines, ranges from several dozen to several thousand vibrations per second. The total number of loading cycles on engine components as a consequence of such oscillations runs into the hundreds of millions over the lifetime of the engine. Therefore reliability of gas turbine engine parts and assemblies is achieved by limiting the effects of variable stresses sigma-v in these components, with a safety margin relative to fatigue limit sigma-a -- the maximum level of stresses under the effect of which it does not experience failure in the course of the so-called base number Nb of loading cycles.

It is important to remember that Nb is 10 to the 8th power cycles for engine parts made of titanium alloys, and 2 x 10 to the 7th power cycles for parts made of steel. Figure 2 contains a typical material fatigue curve. Its physical significance consists in the fact that the higher the level of variable stresses, the shorter the life of an engine part or assembly.

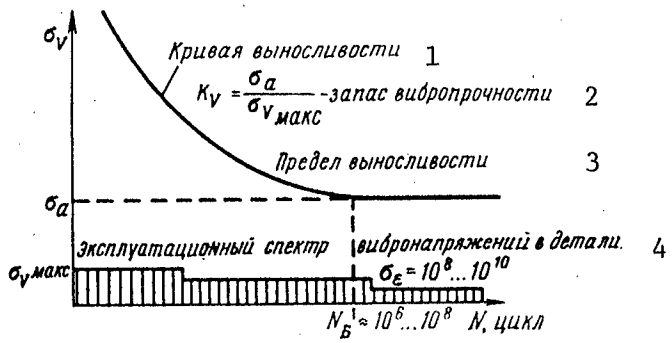

Figure 2. Determination of the vibration strength safety margin in an engine component from its fatigue limit (sigma-a) and vibration loading (sigma tau) characteristics.

Key: 1. Fatigue curve; 2. Vibration strength safety margin; 3. Fatigue limit; 4. Operational spectrum of vibration stresses in engine part

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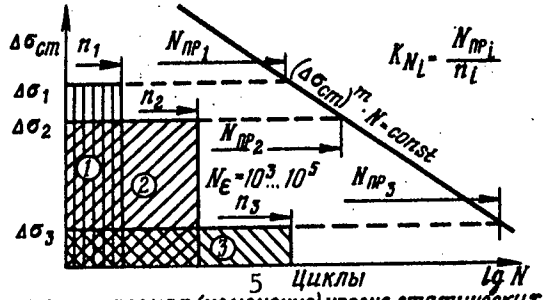
Specialists should also bear in mind that adopted safety margins Kv as a rule do not limit the service life of gas turbine engine parts as regards high-cycle fatigue strength. In practice, however, parts frequently fail due to insufficient actual vibration strength safety margins or as a result of mechanical and corrosion damage. This happens most frequently to compressor

blades, which are subject to the greatest vibration stress. Therefore in gas turbine engine operation and maintenance, aviation engineer service specialists must rigorously observe the specified regulations and periodically inspect an engine's air-gas passages in order promptly to detect mechanical damage to engine parts.

Low-cycle fatigue in engine parts and assemblies is frequently linked with the periodicity of engine operation and the multiple-configuration nature of engine operation in the air, when operating loads proper do not cause excessive stresses. Repeated operation of an engine, however, promotes the development of fatigue in components. The number of component loading cycles in this instance is small in comparison with vibration loads, and may run from 1,000 to 100,000 cycles. The level of loads in the cycle is determined by engine operating configuration and flight conditions. The aggregate of alternating loads connected with change in engine operating conditions during a single sortie comprises a flight cycle (PTs). A standard flight cycle (TPTs) can be specified for aircraft of each type, according to their function, while several standard flight cycles can be specified for multirole aircraft.



1 $\Delta\sigma_{cm_i}$ - размах (изменение) уровня статических напряжений в цикле;
2 n_i - количество циклов нагружения;
3 $n_{пр_i}$ - циклическая долговечность детали;
4 1,2,3 - спектр малоцикловых нагрузок; 1- отнулевые циклы (запуск-выход на максимал-включение), 2 - полные приемистости, 3 - частичные приемистости.

Figure 3. Determination of margin of safety as regards cycles.

1. Amplitude (change) in level of static stresses in cycle; 2. Number of loading cycles; 3. Cycle life of part; 4. Range of low-cycle loads (1 -- startup cycles (startup-runup to maximum rpm-engagement), 2 -- full accelerations, 3 -- partial accelerations); 5. cycles

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Figure 3 presents the physical essence of determination of the margin of safety for a part or assembly on the basis of loading cycles. The complex nature of calculating it is due to determination not only of the maximum value of loading cycles Nma for each part, but also the actual number of cycles and their intensity during operation of a gas turbine engine in the course of its established service life. Therefore until recently specialists did not calculate low-cycle fatigue of engine parts, but confirmed safety margins of resistance to low-cycle fatigue experimentally in the course of static-testing refinement of aircraft engines.

The significance of low-cycle fatigue has increased considerably with the operation of high-temperature gas turbine engines, which incorporate cooled components in their design, particularly turbine blades and disks. This is due to the fact that the percentage share of thermal stresses has increased considerably in the overall static stresses on engine components, and the overall stress loading on parts has increased. This has greatly complicated the task of ensuring parts a long cycling life. One should also note that in the process of refining a gas turbine engine it is not always possible to model or simulate all its performance characteristics in full measure, particularly as regards loading cycles. This is one of the reasons why defects connected with low-cycle fatigue appear on some engines in the process of operation.

Special equivalent-cycle test (ETsI) programs have recently been devised in the Soviet and worldwide aircraft engine industry to eliminate such problems, based on synthesis of gas turbine engine operating experience, programs which make it possible most effectively to pinpoint parts and assemblies of gas turbine powerplants with inadequate cycle-resisting strength. As a result modern gas turbine engines as a rule do not carry restrictions on number of operating cycles in the course of their specified service life. Nevertheless, in view of the considerable effect of variable operating conditions on principal engine components, we must emphasize that such operating

conditions should be minimized in order to ensure high reliability of gas turbine engines. Abrupt throttle (RUD) movement from a low to maximum power setting and back, with maximum fuel feed into the combustion chamber, and therefore gas temperature jump at the turbine inlet, leads to particularly adverse consequences. Thermal stresses in gas turbine engine hot-section parts reach maximum values in this instance.

Figure 4 shows the nature of change in engine parameters during acceleration from low to maximum throttle setting at various rates of throttle movement. It is evident that with smooth throttle advance the engine reaches maximum output practically at the same time as with an abrupt throttle advance (in 1-2 seconds), but excess fuel and gas temperature (DeltaPf and DeltaTg) are 15-20 percent less. Consequently absolute values will also be lower, as well as amplitude of change in thermal stresses sigma-t in the turbine blades. This is why abrupt throttle movements should be avoided during engine operation in flight, if there is no need.

Analysis of flight recorder tapes indicates that a considerable variance is observed in the number of variable engine operating conditions during performance of the same type of flight assignment. One also notes a considerable difference in the manner of controlling the aircraft by different pilots. This is connected not only with an aircraft's position in formation during formation flying but also individual peculiarities, degree of

proficiency and pilots' knowledge of the dynamic properties of engine and airframe as one amasses flying experience.

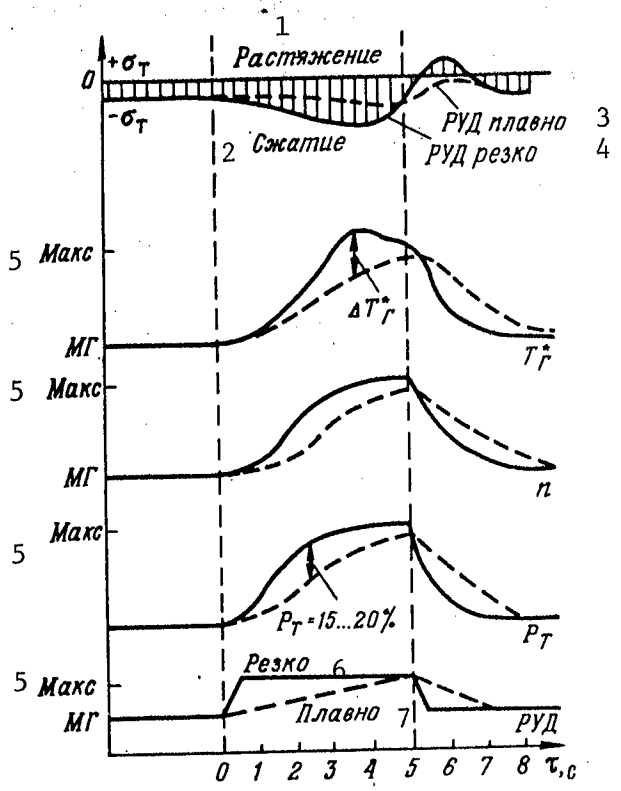

Figure 4. Influence of rate of throttle movement on the nature of change in principal parameters of a gas turbine engine and thermal stresses in the leading edge of a cooled turbine blade.

Key: 1. Tension; 2. Compression; 3. Smooth throttle advance; 4. Abrupt throttle advance; 5. Maximum; 6. Abrupt; 7. Smooth

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Increase in demands placed on reliability and service life of gas turbine engines in the course of operation advances the task of optimizing engine operation in flight, including in variable operating conditions, by adopting automated systems. This problem, however, has not yet found an adequate practical solution. Therefore economical consumption of an engine's service life, especially in high-performance and variable gas turbine engine operating conditions, is entirely dependent on those operating the aircraft. In view of this factor, in the process of training flying personnel it is essential to analyze a pilot's engine control actions in flight on the basis of objective monitoring means [flight recorder tapes] and to draw up appropriate recommendations aimed at reducing gas turbine engine variable operating conditions.

As we see, the reliability of an aircraft engine is determined not only by the safety margins which are engineered into it during the design process but also by aircraft operating conditions. An economical, solicitous attitude toward utilizing an engine's service life and performance capabilities is one of the important conditions for safeguarding aircraft equipment and ensuring flight safety, which is of great importance to the state.

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IMPROVING SAFETY OF MILITARY MOTOR TRANSPORT

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) p 40

[Article, published under the heading "Know-How of the Best in the Combat Arsenal," by Lt Col N. Rasskazov: "Difficult Kilometers"]

[Text] It is impossible today to conceive of military logistics operations without motor vehicles -- transport and specialized, prime movers and fuel tankers. Regardless of what tricks the weather may play, every Soviet airfield is prepared at all times to receive and send off fixed-wing and rotary-wing aircraft. This state of preparedness is achieved in large measure due to competent centralized utilization of motor transport and specialized equipment and a high degree of professional competence on the part of driver personnel and technical specialists, who perform the extremely necessary job of supporting the combat training of USSR Armed Forces personnel.

As a consequence of rapid growth of our country's automotive fleet and increased driving speeds, there has occurred a substantial increase in traffic intensity on our roads and streets. This must be borne in mind in organizing driver training classes and in choosing optimal urban vehicle routes. The spring season places certain demands on operation and maintenance of motor vehicles. In our outfit the experienced drivers, under the supervision of command personnel and other superiors, prepare for spring operations in advance and help their young colleagues master the finer points of their job. This has a positive effect on progress during their familiarization.

The party organization headed by highly-skilled specialist M. Yushchenko, which offers solid support to the commanding officer, mobilizes drivers for successful accomplishment of the tasks assigned to our outfit and for seeking out unutilized reserve potential.

A driver in our subunit, party member V. Gribov, was named best in job category according to the results of the most recent traffic safety competition. Driver V. Sebelev saved 2.3 sets of tires in the time it took to run through 5 sets. Nor are the young people lagging behind their older comrades. As much as 9 percent of the monthly savings of fuel and lubricants is achieved by Komsomol members I. Chervyakov, A. Korol'kov, S. Ivannikov, and I. Burlinov. Their success is not mere happenstance, but the result of a

constant endeavor to increase one's technical knowledge, to find ways to save money and materiel, and to achieve accident-free operation of motor vehicles.

Experience indicates that if driver personnel are carefully selected, if rules and regulations pertaining to servicing and caring for motor vehicles are rigorously observed, if there is constant, painstaking work in the area of ideological-political indoctrination of each and every member of the outfit, and if depot activities are well conceived and organized, the training process proceeds in an orderly manner, with continuity and without accidents, with assigned tasks performed with excellent quality.

Accident-free operation of motor transport on routes of varying complexity depends in large measure on skilled organization of driver specialized and technical training. A great deal of attention is devoted to this matter in our unit. Socialist competition vanguarders A. Bezrukov, Ye. Makhurin and other experienced specialists, for example, are willing and eager to perform any work pertaining to organizing and improving training facilities, and they endeavor to pass on their wealth of experience to the younger personnel.

The statistics of motor vehicle accidents indicate that a substantial number of mishaps occur due to driver failure to observe traffic rules. In order to prevent accidents and boost the technical skills of driver personnel, our vehicle pool follows the practice of thoroughly analyzing the causes of motor vehicle accidents, working jointly with State Motor Vehicle Inspection and Military Motor Vehicle Inspection officials. On this basis conclusions are reached for practical training of driver personnel, conclusions which are taken into account in drawing up month and quarter work plans.

Traffic safety during hours of darkness is greatly affected by such a factor as becoming blinded by the headlights of an oncoming vehicle. Some drivers, especially young ones, fail to consider the fact that one can blind with one's high beams the drivers not only of oncoming vehicles but also of vehicles traveling in the same direction. This occurs particularly frequently during movement in a column on turns and curves. Upon approaching such points, one should switch from high to low beams in advance.

Night marches require considerable physical exertion and stamina. It is therefore a paramount obligation on the part of every driver to pay constant concern to one's physical fitness and psychological preparedness to surmount difficulties.

Strict observance of requirements imposed on movement in conditions of limited visibility, maintaining a vehicle in proper working order, and concern with boosting the level of technical and specialized knowledge and professional skills is a guarantee of accident-free operation. We are convinced of this by the experience of our subunit's top drivers.

Socialist competition plays an important role in achieving high results. It is based on the individual pledges of drivers, who are preparing to honor in a worthy fashion the 40th anniversary of the Great Victory and the 27th CPSU Congress. Competing with one another, drivers are endeavoring to accomplish

ahead-of-schedule performance of plan targets, excellent mastery of their vehicles, knowledge of traffic rules and regulations, thrift and economy.

The party and Komsomol organizations constantly concern themselves with socialist competition publicity. Accomplishment of pledges is regularly discussed at party and Komsomol meetings, in Komsomol groups, and is promptly reported in visual propaganda materials. Political indoctrination work is organized in such a manner that every driver becomes profoundly aware of the trust which he has been given and becomes permeated with a strong feeling of responsibility for exemplary truck operation.

Day-by-day labor produces results. The difficult kilometers of numerous routes are being successfully mastered by young drivers and are becoming the foundation of their success in mastering their beloved profession.

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AZERBAIJAN SATELLITE REMOTE EARTH SENSING PROJECT DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) p 41

[Article, published under the heading "The Space Program Serving Science and the Economy," by V. Lyndin: "Solar Experiment"]

[Text] "Gyunesh" is the Azerbaijani word for sun. Sun means light, warmth, and the hues of the world around us. Utilization of the optical band of solar radiation, its visible and infrared regions, formed the basis of aerospace methods of remote Earth sensing in the Gyunesh-84 experiment, which was conducted last year on the territory of Azerbaijan. Scientists and specialists from Bulgaria, Hungary, the German Democratic Republic, Cuba, Mongolia, Poland, the Soviet Union, and Czechoslovakia took part in devising methods, designing and building equipment, as well as in the investigations proper.

The nations of the socialist community have amassed a great deal of experience in studying our planet. This has made it possible to proceed with the execution of large-scale projects which are of a scientific-technical and economic directional thrust. Such, for example, was the "Chernoye More" [Black Sea] experiment conducted in 1983. Photographic imaging and spectrometry of that body of water in the vicinity of the Crimean coast were conducted from a fixed-site oceanographic platform in the sea, from ships, aircraft, and from the Salyut 7 station. These studies were continued in 1984. The Gyunesh-84 experiment was conducted simultaneously.

Both experiments are characterized by the principle of "multiple-stage" investigation. This principle is not new, and was dictated by practical experience. Photographs and spectrograms taken from space contain a great mass of information. But it is no simple matter to isolate that information. Efforts are hindered by distortions caused by viewing port glass,the Earth's atmosphere and the immediate environment around the space station. "Multiple-stage" observations have the task of eliminating these distortions. Seven "tiers" were simultaneously utilized for the first time in the Gyunesh-84 experiment to study natural systems by contact and remote methods. The plan called for quasi-synchronous imaging of the target area from the Salyut 7 orbital station, fixed-wing aircraft, helicopters, and directly on the Earth's surface.

The orbital station crew employed KATE-140 and MKF-6M fixed-mount cameras. The An-30, An-2, and Il-14 flying laboratories were fitted with thermal radiation imaging devices, spectrometric infrared and ultrafrequency radiometric systems (including the MKF-6M camera). The Mi-8 rotary-wing flying laboratory carried similar equipment, with the exception of thermal imaging devices and cameras. Ground investigations were equipped with a mobile ground automated data collection system, designed for efficient, regular collection and preliminary processing of information on natural features.

The Institute for Natural Resources Space Research -- the lead enterprise of the Azerbaijan SSR Academy of Sciences Space Research Scientific-Production Association -- was the base organization and coordinator of Gyunesh-84 project activities. The data collection system it designed for equipping the aerospace test areas has no design-engineering counterpart either in the Soviet Union or abroad. It provides for acquisition and preliminary processing of information of a prospecting and operational nature as well as the capability to shift, according to a preselected program, from sporadic to regular measurements of various parameters of natural features.

The Sheki-Zakatalskiy test area in the northwestern part of Azerbaijan was selected for conducting the experiment. Its unique natural conditions make it possible to devise methods of investigation for studying many of our country's regions. The test area, 200 kilometers in length and 60 kilometers wide, contains 6 of the world's 12 existing climatic zones -- from semidesert to alpine tundra. There is also considerable topographic relief -- with elevations running from 100 to 3,500 meters above sea level. Four test sections (four different geosystems) were designated within the test area for the Gyunesh-84 experiment: valley hydrology (Sovkhoz imeni Sergo Ordzhonikidze); alpine meadow and forest (the area around the town of Zakataly), saline and solonchak (lake Adzhinour and adjacent terrain), and freshwater body (Mingechaur Reservoir).

The Sovkhoz imeni Sergo Ordzhonikidze in Shekinskiy Rayon, the largest sovkhoz in the Azerbaijan SSR, specializes in growing grain. Soil moisture, groundwater level, and types of underlying geofiltration surfaces affect the fertility of agricultural land and consequently crop yields.

Encroachment by the steppe onto forest margins leads to deterioration of the soil, decline in biological productivity, development of erosion, and increased mudflow danger. The dynamics of these processes can be traced most fully and effectively with the aid of space hardware. But first of all it is necessary to devise a precise method of interpreting satellite imagery. For this purpose ground observations of the alpine meadow and forest geosystem of the southern slope of the Caucasus Mountains near the town of Zakataly were conducted synchronously with remote aerospace investigations. They consisted in determining the species composition of the flora, its biological and biometric parameters, as well as a physical and chemical analysis of plant and soil specimens.

Four centuries ago Lake Adzhinour was a large, freshwater lake.

Today its surface area has shrunk to 1/12th of its former area, and life has disappeared from its waters due to a high salt concentration. The dying lake is increasing mineralization of the groundwater and is leading to increased salinity of an extensive area adjacent to the lake. The Adzhinour Steppe totals 20,000 hectares of solonchak together with the lake. One aim of the Gyunesh-84 experiment in this locality was to devise a method of estimating soil salinity and mineralization of subsurface and surface water. In addition to aircraft and satellite observations, ground services specialists drilled boreholes in the area around the lake, took soil samples for subsequent chemical analysis, determined the groundwater level, and studied the physicochemical composition of the lake. Scientists are hoping to bring it back to life and to restore fertility to the land in the vicinity. To achieve this, it is essential thoroughly to determine the degree of salinity of water and soil.

The fourth test section -- the Mingechaur Reservoir -- is the largest man-made freshwater body of water in Transcaucasia, created on the Kura River by the dam of the Mingechaur GES. Scientists studied the distribution of suspended matter at this site and the influence of hydrodynamic processes on suspended matter concentration. In addition to remote sensing from satellite and aircraft, scientists on board the scientific research vessel "Zardobi" determined water transparency, water electrical conductivity and temperature, and took samples to determine content of suspended matter, chlorophyll, and other impurities. Wind velocity and air temperature were also recorded. Establishment of the patterns of relationship between these parameters will help in tracking the dynamic state of the reservoir, which plays an important role in the economy of an extensive area within Transcaucasia.

The main goal of the Gyunesh-84 experiment was to improve the applied physical and scientific-method aspects of study of the Earth from air and space. Accomplished tasks included checking out different variations of design and construction of technical devices for implementing and supporting investigations at all levels; comparative tests were run on equipment designed and built in various countries. In addition, a number of practical tasks were accomplished in the course of the experiment. For example, soil moisture maps of the fields of the grain Sovkhoz imeni Sergo Ordzhonikidze were provided to that farm. Maps of distribution of salts in Lake Adzhinour were prepared. The biochemical composition of the water in the Mingechaur Reservoir was refined and detailed. Azerbaijan scientists received a great deal of new data on soil composition and occurrence of plant diseases in fields and forests. And, most important, these tasks were accomplished much faster than usual.

The Gyunesh-84 experiment is a component part of a specific combined program of study of geosystems by aerospace methods. This program unites the efforts of the nations of the socialist community for peaceful purposes, for the sake of progress and for the good of mankind.

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SOVIET SPACE MUSEUM AT COSMONAUT TRAINING CENTER

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 3, Mar 85 (signed to press 1 Feb 85) pp 42-43

[Article, published under the heading "Readers Request," by twice Hero of the Soviet Union, Pilot-Cosmonaut USSR, Maj Gen Avn A. Nikolayev and Col (Res) N. Kopylov: "Star City Museum"]

> [Text] This journal's readers have requested that we tell about the museum at Star City. The following article is in response to their request.

Everything in the room looks as if the person working there has just stepped out for a moment. A desk, armchair, bookshelf, a portrait of Academician S. P. Korolev, a model of the K. E. Tsiolkovskiy memorial in Kaluga, globes of the Earth and Moon, an enormous geographic map of Europe and Asia taking up an entire wall, a panoramic photograph of the Smolensk Kremlin, telephones -- these items, which have become historic mementos, furnished the office of the world's first cosmonaut. On the desktop we see documents, letters, a calendar opened to 27 March, bearing a memorandum written by Yuriy Alekseyevich Gagarin. The desk also contains the correspondence of his final days and the text of a speech prepared by Yu. A. Gagarin for presentation at a formal meeting of the board of the Union of Writers, dedicated to the A. M. Gor'kiy birth centennial.

One of the bookshelves contains dozens of books in various languages of the peoples of the world, and each book bears a personal inscription by the author or words of gratitude from the publishers. Scholars, poets and writers sent their books to Gagarin, asking for advice and comments. The other contains Yuriy Alekseyevich's overcoat, service cap and scarf which he wore when heading for the airfield on 27 March 1968. The hands of the wall clock are stopped at 10:31. That morning Yuriy Alekseyevich was not merely getting another look at the Earth's blue halo -- he was working. He was working, as he had been working on the previous day, preparing for missions in space.

The Zvezdnyy Gorodok [Star City] Museum contains a large collection of photographs of obelisks and monuments erected in honor of the world's first cosmonaut in various cities in the Soviet Union and abroad, as well as an extensive collection of the decorations, medals, and certificates honoring

Gagarin's feat. The search for and collection of certificates attesting to making Yuriy Alekseyevich an honorary citizen of various cities and towns is continuing.

Displays in another room of the museum continue the story of Gagarin. His party and Komsomol cards, graduation diplomas from the Saratov Secondary Technical School, Orenburg Pilot School, and the Air Force Engineering Academy imeni N. Ye. Zhukovskiy, the credentials of an officer in the Soviet Armed Forces, deputy to the USSR Supreme Soviet and membership in the All-Union Komsomol Central Committee, his pilot's log book, accumulated plotting boards and flight sheets filled with Yuriy Alekseyevich's precise, even handwriting, and certificates of the Presidium of the USSR Supreme Soviet on conferment to him of the title Hero of the Soviet Union and Pilot-Cosmonaut USSR. Displayed alongside them is a very rare photograph taken in 1947. The photograph shows Academician Sergey Pavlovich Korolev wearing a cinched-up overcoat and a field cap, after the launching of the first ballistic missile. There is a small box containing a handful of earth from the site where the hero was killed. Standing in the center of the room is a bust of Yu. Gagarin sculpted back in May 1961, a gift from the sculptor People's Artist USSR G. Postnikov.

The second part of the exhibit contains materials connected with the trips abroad made by the world's first cosmonaut, as well as his first foreign gift -- a cast metal statuette of a foundry worker, given to Gagarin as to a brother worker by the workers of the CKD-Stalingrad Plant in Czechoslovakia.

"This gift is particularly precious to me," Yuriy Alekseyevich told them, "because no matter where I may voyage in space -- to the Moon, Mars, or another planet, I shall always remain a worker in my heart, your class comrade."

Gagarin visited France in September 1963. At a memorable get-together with veterans of the French Communist Party, Maurice Thorez, general secretary of the Central Committee of the French Communist Party, presented him with the Communard Medal. The French Communists saluted in this manner the feat accomplished by a Soviet citizen. The heroes of the Paris Commune were awarded such a medal (they numbered only a few dozen).

The visitor's attention is also drawn by that corner of the room containing the cosmonaut's wristwatch which counted off the 108 minutes of his illustrious flight, a volume entitled "Povest' o nastoyashchem cheloveke" [Tale of a Real Person] bearing a personal inscription by the author, and a small card identifying the bearer as Cosmonaut No 1.

The displays contained in the museum's two other large rooms tell of Gagarin's friends, the people who have gone into space following the trail he blazed. In one of the exhibition rooms there is a full-size mock-up of the first artificial Earth satellite and a sculpture portrait of that great Soviet scientist and organizer of the exploration of space, twice Hero of Socialist Labor Academician Sergey Pavlovich Korolev. Displayed alongside is the Vostok spacecraft training simulator and the spacesuits of Yu. Gagarin, G. Titov, and V. Tereshkova. Occupying one of the crew seats in a Voskhod spacecraft is the

spacesuit in which A. Leonov trained for the firstspace walk, and the backpack life support system with which he made the first EVA on 18 March 1965.

Displayed in one of the cases is the NAZ (onboard emergency supplies) kit containing essential equipment and supplies to provide for unusual landing conditions. Another display case contains a complete set of rations consumed by a cosmonaut on board a Soyuz spacecraft and Salyut space station, a water supply system, devices for heating meals, and a variety of foodstuffs.

The visitor's attention is drawn by the Soyuz 4 spacecraft, on board which V. Shatalov was launched into orbit in January 1969, who returned to Earth with Ye. Khrunov and S. Yeliseyev. After docking, they transferred to the Soyuz 4 from the Soyuz 5 by EVA. Displayed here in a glass case is the spacesuit in which Ye. Khrunov made that spacewalk. The descent parachute of the Soyuz 30 spacecraft and a diagram provide a complete picture of the systems' design and operation during landing.

A Soyuz simulator control console, cosmonaut flying suits, Pingvin [Penguin] training and weight loading suits, instruments, apparatus, tools, medical sensors and many other items illustrate our people's achievements in space research and exploration.

There is a gallery of cosmonaut portraits. This room also contains display cases with personal effects, documents, commemorative medals and badges -- items which have been carried on space missions. They include watches worn by V. Bykovskiy and I. Nikolayev, lithograph pictures of V. I. Lenin, and the first space mail -- copies of the newspapers PRAVDA and IZVESTIYA, and two envelopes containing letters addressed to V. Shatalov. They were delivered to the Soyuz 4 spacecraft in January 1969 by cosmonauts S. Yeliseyev and Ye. Khrunov, who transferred from one spacecraft to another by EVA.

Today space mail operates on a regular basis. Visiting crews deliver letters, newspapers, and parcels to the Salyut space station. The space communications post office has its own stamp for canceling mailings in space.

The museum has collected a great many souvenirs and gifts from the toilers of our country and foreign nations. They include porcelain and crystal vases, model airplanes and cars, ships and space stations, goblets and pennants, and an enormous relief globe of the Moon with marked landing sites of Soviet lunar landers and U.S. spacecraft. One's attention is drawn to a portrait of Yu. Gagarin made of synthetic diamonds and an attractive panel fashioned of ears of grain by folk artisans in Kazakhstan. Soviet Kazakhstan has become not only a breadbasket but also a spaceport.

Exhibit displays with gifts from friends abroad tell of cosmonauts' trips to other countries, their mission of friendship, and sociopolitical activities. Displays include a lotus blossom made of pieces of valuable species of woods by Indian artisans, a napkin with the three-dimensional figures of seven swans, fashioned by Portuguese female Communists languishing in fascist torture chambers, and an issue of the underground newspaper AVANTE, on the front page of which there is a portrait of V. I. Lenin. These were gifts to V. Tereshkova from the women of Portugal.

One's emotions are stirred by gifts from the women of Japan: a small melted and fused metal bell -- the only object which had managed to preserve its original shape, gleaned from the rubble remains of a school in the city of Hiroshima following the atomic bombing; a garland made of 98 little colored-paper cranes, a symbol of healing and happiness, a gift to A. Leonov.

Space has proven to be an arena of cooperation where the interests of many nations and peoples have joined together. At the exhibit, for example, we see pennants representing the national flags of the USSR and the United States, flight documents, A. Leonov's suit and headset, a TV camera lens from the Soyuz 19 spacecraft, samples of meal rations eaten by Soviet and U.S. crews, a model of the docking module of the Soyuz and Apollo spacecraft, Frank Borman's watch, and a photograph of Neil Armstrong on the surface of the Moon.

"I am very pleased and happy to have the opportunity to visit this museum and to pay tribute to the person who blazed the trail into space, Yuriy Gagarin," Frank Borman wrote in the visitors' book at the Star City Museum on 5 July 1969. One year later, on 1 July 1970, expressing the same kind sentiments, Neil Armstrong added: "I sincerely hope that my visit will be one of many mutual visits by Soviet and U.S. astronauts and that our friendship and cooperation will last endlessly, as the cosmos itself."

The museum displays the national flags of all countries citizens of which have flown on space missions in the cooperation program, photographs of cosmonauts, pennants, certificates of international manned missions, commemorative medals, badges, emblems, miniature additions of books, and the personal effects of cosmonauts who flew manned missions.

For two and a half decades now the people of Earth have been storming the stellar ocean, bursting the confines of their planet, overcoming enormous difficulties and bringing to bear their entire strength of will, their talent and labor. Gifted engineer-test pilot and Pilot-Cosmonaut USSR Vladimir Mikhaylovich Komarov, while flight-testing the first Soyuz spacecraft, was killed on 24 April 1967 on the road toward achieving this goal.

Displayed in the memorial portion of the museum exhibit are V. M. Komarov's dress uniform bearing the lofty decorations he was awarded, his party card, documents, books and photographs. Also on display is a portrait of Karl Marx, a copy of the one which is being carefully preserved at the Institute of Marxism-Leninism.

Pilot-Cosmonaut USSR Pavel Ivanovich Belyayev met an untimely death, at the height of his successful career. On display at the museum are his party card, his military uniform bearing government decorations, personal effects, and documents attesting to the fact that on 18 March 1965 he accomplished a feat for the first time in the history of mankind -- he opened the airlock of the Voskhod 2 spaceship, and A. Leonov made a spacewalk.

In July 1971, when a crew consisting of Georgiy Timofeyevich Dobrvol'skiy, Vladislav Nikolayevich Volkov, and Viktor Ivanovich Patsayev was working on board the Salyut 1 orbital space station, when the Earth was picking up from

space the station's callsign "Yantar'" [Amber], a gift arrived at the Soviet Embassy in Vienna from the small Austrian town of Bernstein [amber]. The town's mayor, on behalf of the townspeople, who were thrilled at the courage of the Soviet cosmonauts, requested that they forward to the crew members a vase made of semiprecious stone, specially fashioned in their honor. But the gift arrived at Zvezdnyy Gorodok in a flood of condolences. Today it preserves the warmth of human hearts and the memory of three heroes.

Museum holdings include more than 15,000 documents, items of space hardware, cosmonaut flying gear and clothing, test beds and simulators, national flags, pennants, decorations, medals, souvenirs, and gifts.

The museum has grown from an exhibit of gifts to Soviet cosmonauts into a historical-scientific and cultural-educational establishment, publicizing the achievements of the Soviet people in space research and exploration as well as the unparalleled heroism of the pioneer explorers of the universe.

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HISTORY OF COSMONAUT TRAINING CENTER OUTLINED

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[Article, published under the heading "Star City Then and Now," by AVIATSIYA I KOSMONAVTIKA correspondents, in interview format: "Birth of the Cosmonaut Training Center"; concluding part of a three-part article]

[Text] (Ye. Cherkasov): The specific features of cosmonaut training required a quiet location. Of several possible TsPK [Cosmonaut Training Center; CTC] sites, they selected the one which most fully met the requirements. A large, virtually empty site in a rayon in Moscow Oblast satisfied requirements for future growth and development. There was a highway and a rail line in the vicinity, and this was a factor of no little importance. There was also another argument in favor of establishing the Cosmonaut Training Center here: there was construction planned here at the end of the 1940's and beginning of the 1950's, a plan which was subsequently abandoned, but the woods on the site had already been cleared, and foundations had been constructed for several buildings. Temporary hut-type barracks for the construction workers were also still standing. Naturally future construction prospects for Zvezdnyy Gorodok [Star City] were not yet clearly defined at that time, but the fact that clearing, grading, and pouring of foundations for the Center's principal buildings were already completed was of considerable significance under the circumstances. As we know, it is always difficult to undertake construction, but during those years, when rebuilding of the nation's economy following the war was still in progress, it was doubly difficult. The national interest demanded that we economize in resources.

Soon the site was formally turned over for construction of the Cosmonaut Training Center, and Ye. Karpov asked me to be his deputy in charge of construction. That is how I became a direct participant in building Zvezdnyy.

Designing of the first buildings commenced in the fall of 1960: a dispensary, an administrative building, classroom and training simulator buildings, a garage, and a dormitory. Standard architectural designs were used in order to speed construction. A hotel design was adopted for the dispensary, for example, a standard school building design was adopted for the classroom building, and a locomotive shed design was adopted for the simulator building.

We simultaneously were building a boiler house, a transformer substation, water lines and treatment facilities.

V. Sedov was the first head of construction at the Center. He maintained a very high pace of construction. The dispensary and a classroom building were ready to go within a year. A sports stadium with a track, and a swimming pool were required for cosmonaut training. I should note that at the time funds were being allocated primarily for construction of housing, while special authorization by the USSR Council of Ministers was required to build cultural centers, sports stadiums, and swimming pools. We received such an authorization for the stadium, and swimming pool authorization was saved by its dual function: it was also to serve for the conduct of descent module on-water experiments. Therefore on the construction schedules it was listed as a water-landing laboratory. There were no delays in preparing documentation or in construction.

One of the most critical situations during the first years of operations in Moscow Oblast was the housing of the future cosmonauts and the personnel serving them. People were commuting several kilometers to work. We began thinking about building housing at the CTC. Things commenced with architectural design. It was proposed that a competition be held between two organizations: a Moscow and a Leningrad organization. The Muscovites prepared six variations, while the people from Leningrad prepared two. Presentation of designs took place in the office of our boss, Aleksandr Nikolayevich. Yu. Gagarin took part in discussing them. I must state that he always had a good understanding of and stewardly good-management attitude toward matters pertaining to the construction of Zvezdnyy Gorodok. Aleksandr Nikolayevich proposed settling upon one of the Moscow designs, refining it in conformity with our comments. That decision essentially opened up the way to the creation of today's training center.

This was a time of convincing victories by the Soviet people in space. The country was rejoicing over the manned missions of Yuriy Gagarin and German Titov, who had vividly demonstrated our might and capabilities, while a new experiment was being readied at the Center -- a two-man mission to be flown by P. Popovich and A. Nikolayev. Manned space exploration was commencing its victorious march. The Center was growing and maturing together with it.

Problems of transportation were arising. Essentially the solution was obvious: build a railway station platform. But it proved to be a difficult task to accomplish. It was necessary to appeal to Deputy Minister of Railways N. Gundobin. The commission he appointed recommended construction of a railway station platform at kilometer 43 on the Yaroslavl' Railroad.

The station platform was completed in six months. A mass meeting was held to dedicate it, at which a bottle of champagne was smashed against the tracks according to the old Russian tradition, and service to Tsiolkovskaya Station commenced. Several years later the Moscow railroad performed renovation, and a second platform appeared at Tsiolkovskaya Station.

There also arose a good many problems with landscaping. At first we worked on these problems ourselves, but we later realized that they were beyond our

capabilities. At the Moscow Soviet they recommended that we speak with N. Ankudinova, who was in charge of landscaping in one of the rayons in Moscow. We quickly found common ground. Shrubs, lawns and flower beds were planted at the center. They still today produce flowers from May through October. The grounds became more attractive with each passing year. Soon the potato field and vegetable gardens around Zvezdnyy disappeared. On the basis of an agreement reached with the Monino forestry section, birches and conifers were planted in their stead. The site is today a forest, where people go mushroom gathering. It has become a rest and recreation site for the people of Zvezdnyy.

We had long dreamed of the lakes which today grace Zvezdnyy, but it was happenstance which helped us proceed with carrying out our dream. When one of the two buildings in which cosmonauts are presently housed was turned over for occupancy, its residents decided to have one big housewarming. They were the first ones in whose internal passports appeared the word "Zvezdnyy" as place of residence. A. Leonov was elected chairman of the organizing committee, and I was elected deputy chairman. We invited as guests MSU I. Bagramyan and Gen A. Rytov, member of the Air Forces Military Council.

A mass meeting was held. The first speaker was Leonov. He told about the Center, its residents, and thanked the guests for their help. Bagramyan then spoke. He stated that our training center would unquestionably go down in the nation's history and that all its residents should be proud of participation in the great accomplishments of the first socialist country. Ivan Khristoforovich soon left, and we decided to take the remaining guests on a tour, showing them what was being built and where. We climbed on board a bus and toured the center. Soon we halted by a lake. We gathered around a bonfire and watched the future cosmonauts practicing on water skis. At this point Aleksandr Nikolayevich firmly decided that we needed a lake very badly. He called me and told me to come to his office on the following day with any suggestions I might have on a lake.

Today this lake is encompassed within the Zvezdnyy residents' recreation area. And strung alongside are an additional two lakes. They teem with fish. Hundreds of ducks fly here each year.

When the Zvezdnyy master plan was being debated, we did not examine in detail each and every building. This is understandable, for such a necessity arises just prior to specific construction. Such was the case with the House of Culture, which is today called Cosmonaut House. At the time of construction we felt that the standard design was inappropriate, failing to take into account the Center's future development. S. Yegupov and I set out for Aleksandrov, where an identical building was under construction. We went to the building site, examined the building, and became convinced that we were right. We proceeded to look for a replacement. In the office of one of the architects I had seen the plan of an experimental recreation center, which I had liked very much. We showed it to N. Kamanin, Yu. Gagarin, and other comrades. They approved. Following tradition, the first concert in the building was given for the construction workers, and the second was for the training center's residents.

The Zvezdnyy Gorodok museum opened at the House of Culture on 6 November 1967, on the eve of celebration of the 50th anniversary of the Great October Socialist Revolution. The museum heralded the training center's maturing. The museum's first visitors were leaders of democratic youth organizations from 82 countries, and Yuriy Gagarin acted as their guide.

Zvezdnyy Gorodok.... Today nine-, twelve-, and sixteen-story apartment buildings and service buildings of the CPC rise up among the pines and spruces. The cosmonauts and those who prepare them for manned missions live and work here. At their disposal is a unique training complex, centrifuges, weightlessness simulation tanks, scientific laboratories, medical examination rooms, and classrooms. They have their own planetarium, athletic facilities, swimming pool, and flying laboratories.

The Cosmonaut Training Center imeni Yu. A. Gagarin will be celebrating its 25th anniversary in April 1985. The alumni of this, the world's first "international space academy" include 59 USSR pilot-cosmonauts, nine representatives from the socialist countries, and cosmonauts from France and India.

Today people come here from every part of our country to "breathe in the air of space," to become acquainted with outstanding accomplishments of our age. And we veterans are happy and proud of the fact that our labor has been a part of this.

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